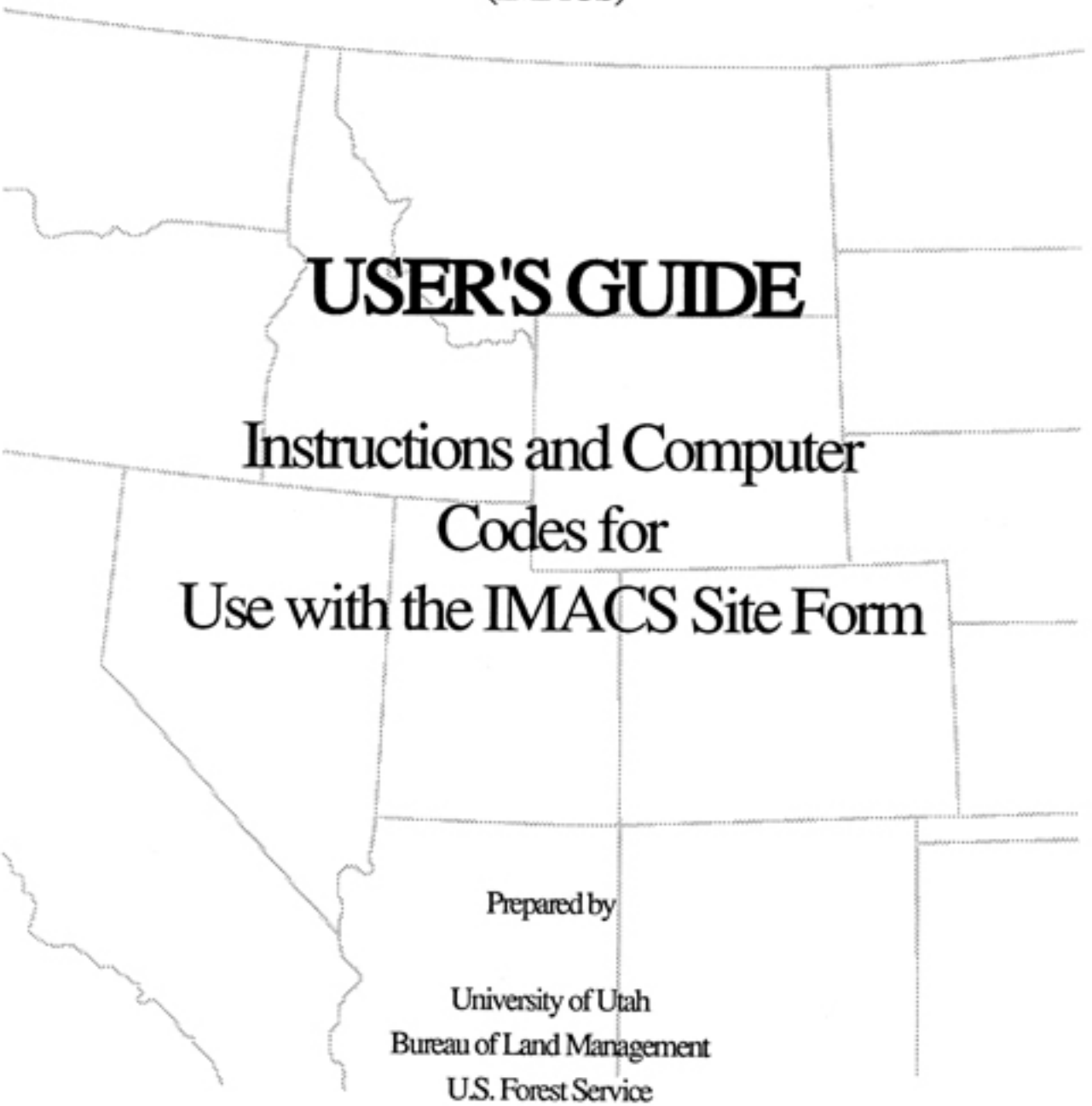
Intermountain Antiquities
Computer System
(IMACS)



USER'S GUIDE

Instructions and Computer Codes for Use with the IMACS Site Form

Prepared by

University of Utah
Bureau of Land Management
U.S. Forest Service

1982
Revised June 1992

INTRODUCTION

The purpose of this section is to provide archaeologists with a manual for a standard approach to arriving at historical artifact function and chronology. The purpose of defining artifact chronology and function is to assign a function and occupation range to historic sites. This section provides a means for preliminary identification only and is not intended to be complete or exhaust the subject of historic artifacts.

Also, the level of intensity of analysis may not be necessarily commensurate with the nature and complexity of the site. Estimates of numbers of various artifact types may be more appropriate for large sites rather than detailed descriptions which are more appropriate to small sites.

The specific artifact classes represented here are the most common to be found on historic sites and are generally the most diagnostic.

Evaluations of any site should not be dependent solely on surface features and artifacts, but must be complimented by historical documentation.

The basic intent of this section is to provide source material for identification and dating of historic artifacts and to refer user to references cited.

100 - INTRODUCTION AND GENERAL INSTRUCTIONS

This Guide contains instructions and computer codes for the IMACS Site Form. This form is approved for use in the following areas:

Utah - BLM, NPS, and USFS administered lands. State lands.

Idaho - BLM administered lands (except northern Idaho). All Region-4 National Forests (Payette, Boise, Salmon, Challis, Caribou, Sawtooth, Targhee NF's). State lands.

Nevada - All BLM and USFS administered lands. Department of Highways lands/projects.

Wyoming - Targhee and Bridger-Teton National Forests, all BLM and NPS administered lands.

California - Toiyabe National Forest.

The IMACS Site Form consists of five separate parts: Part A - Administrative/Environmental Data; Part B - Prehistoric Data; Part C - Historic Data; and a separate encoding sheet. Thus, the minimum site record consists of Part A plus one additional section, as appropriate. The encoding sheet is also required in all cases. The forms are available in the FORMS section.

THE SITE FORM MUST BE COMPLETE, EVEN IF THE ANSWER IS "NONE". ALL ENTRIES MUST BE TYPEWRITTEN, EXCEPT THE COMPUTER CODING SHEET.

The completed site form must be accompanied by a sketch map.* The map should show major site details and locations of collected artifacts. It should also indicate the relationship of the site to important landforms and proposed impacting projects, if any. A photocopy of the appropriate USGS map locating the site should also be attached, unless this information is provided elsewhere.

Site photographs must be taken and made a part of the site form.* They should not be included in the text of the survey report. This will facilitate the duplication and distribution of site inventory data to the various repositories.

It should be noted that the codes contained in this manual are designed for field use only. In regards to management or in house code use, contact the appropriate organization.

(*Sketch maps and site photographs are optional for USFS sites.)

ILLUSTRATIONS.

All illustrations are in a separate section called ILLUSTRATIONS. They were scanned from the original paste-ups and are in JPEG format. Illustrations are numbered with the IMACS section number in which they belong, a short descriptive name, and an illustration number. For example, 472-Bottleschem.jpg is from section 472, depicts chemical/medicine bottles, and is the only illustration of that type of artifact. 473-Ceramics4.jpg is from section 473, and is the fourth page of ceramic illustrations.

110 - IMACS Representatives

The following individuals are representatives for some of the land management agencies that require the use of the IMACS data dictionary.

Bureau of Land Management			
Shelly Smith (Utah)	(801)	539-4066	
Dan Hutchison (Idaho)	(208)	334-1424	FTS 554-1424
Pat Barker (Nevada)	(702)	784-5748	
Ray Leicht (Wyoming)	(307)	772-2535	FTS 328-2535
U. S. Forest Service			
Jerry Wylie	(801)	625-5172	FTS 586-5172
Tom Scott	(801)	524-6333	
Bureau of Reclamation			
Wayne Prokopetz (Utah)	(801)	524-5447	
Antiquities Section, Division of State History			
Evy Seelinger (Utah)	(801)	533-4563	
National Parks Service (Regional Office)			
Adrienne Anderson	(303)	969-2875	
Nevada Department of Transportation			
Hal Turner	(702)	885-5476	
Nevada State Museum			
Amy Dansie	(702)	885-3002	

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Antiquities Section, Division of State History			
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Nevada Department of Transportation			
Hal Turner	(702)	885-5476	
Nevada State Museum			
Amy Dansie	(702)	885-3002	

120 - HISTORY OF IMACS AND ACKNOWLEDGMENTS

The Intermountain Antiquities Computer System is the result of interaction among many state and federal agencies, institutions, and private individuals. Initial attempts at developing a cooperative data base were made in the late 1970's by the University of Utah and the Bureau of Land Management.

With these early efforts, and later in conjunction with the Forest Service, IMACS was created in 1981. Since then, it has grown steadily. With over 50,000 encoded archaeological sites throughout the intermountain west, it is one of the largest cultural resource data bases in the country. Many of the sites presently in the system were recorded prior to the inception of IMACS, with the rest encoded through contracts with the University of Utah, Idaho and Utah State Historic Preservation Offices, and the Nevada State Museum.

Many people have contributed to the development and growth of IMACS. As it is impossible to mention everyone, we would like to thank all the individuals who have worked to make the system a success.

130 - IMACS ADMINISTRATION

The Intermountain Antiquities Computer System consists of separate data base management programs sharing nearly identical data items. While they are different and cannot usually interact directly, these computer systems share the same site form and can exchange site data. Each institution is wholly responsible for the organization and maintenance of its own system. For those individuals who need to access one of the various systems, instructions for each system are available as appendices to this guide. Information about regional variants of the site form should be available in the local SHPO office or from the local offices of most land management agencies.

131 - IMACS Committee.

The IMACS committee consists of representatives of the various land management agencies that require the use of this data dictionary for work performed on their lands, and other interested parties. This committee meets semi-annually to consider alterations in the common data dictionary. As of the Fall 1991 meeting, the variable list is considered frozen for a period of 2 years. New items can be added to an existing variable, but no new variables will be considered until Fall 1993.

132 - Distribution of IMACS Site Form and User's Guide.

Consulting archaeologists with federal antiquities permits requiring the use of IMACS Site Forms may obtain copies of the User's Guide from the University of Utah for a fee of $50. This price include a copy of the full size manual and prepays the next 5 successive updates. Additional copies, or User's Guides requested by non-permitted individuals, may be purchased at the same price. A reduced size manual is also available for an initial fee of $40. This also includes 5 successive updates. Updates for existing manuals can be purchased in sets of 5 for $30. Updates will not be sold individually.

133 - Citations. The proper form for citing the User's Guide is shown below:

IMACS
198* Intermountain Antiquities Computer System User's Guide. University of Utah, Bureau of Land Management, U.S. Forest Service.

* - use current or appropriate year.

200 - FORMS

All forms are located in the file called FORMS. The files are in PDF format and can be downloaded using Adobe Acrobat Viewer, which is a free utility. If you don't have Acrobat Viewer, you can download it here:

http://www.adobe.com/products/acrobat/readstep.html

The following forms are:

Part A - Administrative Data

Part A - Environmental Data

Part B - Prehistoric Data

Part B - Prehistoric Data

Part C - Historic Data

Part C - Historic Data

Encoding Form

Optional forms included are:

Rock Art Data (dated April 1987)

140 - SYSTEM REVISIONS

Modifications will be made to the full IMACS Site Form and User's Guide as needed. You may suggest possible changes using the form provided at the end of this section. Please note that no additional variables will be considered until the fall of 1993.

141 - Approval of Changes. All changes will be reviewed and approved at the semi-annual meetings of the IMACS Committee. Any changes which would affect a major user's computer program must be unanimously approved.

142 - Notification of Changes. Changes will be sent to all prepiad IMACS User's Guide owners New pages will be provided to replace those sections being modified. The old pages should be discarded to avoid possible confusion.

To ensure you have an up-to-date User's Guide, check the date on the bottom of each page and contact the University of Utah.

Suggestions for improving the IMACS User's Guide or site form can be made on this form and sent to the address above. Indicate in item 3 if you would like an immediate reply.

1. This concerns IMACS site form and/or User's Guide
   Section(s) _____.
   Name of section(s): _____.

2. Your suggestion/comments:

3. Your name, address, date. Reply requested. (optional)

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4. IMACS reviewer's comments:

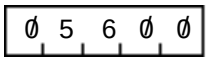
5. Reviewer's name: Date:

6. Action taken:

300 - RECORDING THE SITE: There are two distinct activities involved in recording a site using IMACS. First and foremost is the written description that goes onto the site form itself (Parts A, B, C, and/or attachments). The second activity is encoding. Site encoding translates written site descriptions into computer readable codes on the encoding sheet. All encoded items are identified here and on the site form by an asterisk (*). Other items are recorded on the site form but are not encoded. The site forms contain guide lists to aid you in translating written descriptions into computer codes, but it should be noted that these should only be used for that purpose. Under no circumstances should these "check boxes" be used to record a site instead of writing descriptions.

Using the lettering guide on the bottom of the encoding form, transfer information from the site form to the encoding form. While some ambiguity is inherent in classifying site information, make the best possible choice from the codes listed in this User's Guide. It is best if classification and coding are done as soon as possible by the person who recorded the site.

All numbers should be right justified (placed all the way to the right hand side of the encoding block) and zero filled (Ø in all unused spaces). Alpha characters should be left justified. Spaces between words in A14 and A25 must be left blank.

Example: 5600' = 

When recording historic Native American sites, enter your information on Part C - Historic Sites, not on Part B - Prehistoric Sites, but use appropriate codes from either Part B or Part C of the User's Guide.

It is very important to clearly show the difference between the letter Ø and the character ZERO. Zeros should be slashed in the center, O's should not. Also the letter Z should be slashed in the middle.

Example: = ZERO = Ø

= Z = Ƶ

When entering data where decimal points are normally used, do not insert them. Decimal points are implied.

Example: ØØ7 in the distance to water block, would represent ØØ.7 kilometers.

Encoding should be done as legibly as possible. Please use characters exactly as shown in lettering guide. Unclear handwriting can lead to erroneous key punching. In addition, when submitting a photocopy of the encoding form, or any other documents, be sure the copy is clean and readable. It is advisable to use either a number 2 pencil or a pen on the IMACS encoding sheet.

Please note that under no circumstances, should you create new codes. If additional codes are required, see Section 140.

Do not enter any extraneous marks in the encoding sheet. Assume that anything you entered will be keypunched. Forms containing marks and lines other than encoded values will be summarily rejected.

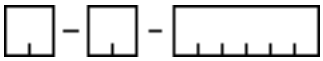
(AA) J.P. Albanese
(AB) Anthro Research, Inc.
(AC) Am. Museum of Nat. His.
(AD) Archeological Associates
(AE) Arch. Research Assoc.
(AF) Arch. Environ. Res. Corp.
(AG) Archeological Rescue
(AH) Arch. Services
(AI) Arizona State Museum
(AJ) Arizona State Park
(AK) ARCON
(AL) Ancient Enterprises, Inc.
(AM) Archeological Consultants
(AN) Archeo Consultants
(AO) Archaeological Energy
(AP) Argonne National Lab.
(AQ) Arch. Consultants (Worland)
(AR) Arch. Research Services
(AS) Abajo Archaeology
(AT) AR Consultants
(AU) Antiquus
(AV) Agency of Conserv. Arch.
(AW) American Arch. Consultants
(AX) Applied Archaeology Consult.
(AY) An Independent Archaeologist
(AZ) Anonymous
(A1) Alpine Arch. Consult. Inc.
(A2) Ancient America Foundation
(A3) Archaeological Consulting Serv.
(A4) Antonette Chambers Noble
(A5) Advance Sciences, Inc.
(A6) Archae. Res. of Southern Nevada
(A7) Adams and Associates
(A8) Arboles Contract Archaeology
(A9) Archae. Res. Consult. Services
(BA) Basin Research
(BB) Boise State University
(BC) Brigham Young University
(BD) Bristlecone, Inc.
(BE) Bureau of Reclamation
(BF) Burgess and Associates
(BG) Burney & Associates
(BH) Buffalo Bill Historical Center
(BI) Bureau of Indian Affairs
(BJ) James Brechtel
(BL) BLM
(BM) B.R. Butter, Assoc.
(BN) Bighorn Basin Consulting
(BO) B.C. Services
(BR) Basin and Range Research
(BS) Baseline Data
(BT) Bennett Management Serv.
(BU) Alan R. Bowles, SLC
(BW) Biowest
(CA) U of Calif., Berkeley
(CB) U of Calif., Davis
(CC) U of Calif., L.A.
(CD) Centuries Research
(CE) Chambers Group, Inc
(CF) Colorado State Univ.
(CG) State of Colorado
(CH) Complete Archaeology
(CI) Cult. Res. Consultants
(CJ) University of Colorado
(CK) Cal. State College
(CL) Chambers Group, Inc.
(CM) Univ. of N. Colorado
(CN) Centennial Archeology
(CO) Cent. Washington Arch. Surv.
(CP) Cultural Reserch/Management
(CQ) Fred Chapman
(CR) Crouch, J.R.
(CS) Crow Canyon Center For Southwestern Arch.
(CT) College of Eastern Utah
(CU) Cultural Resource Group
(CV) D. & J. Chance & Associates
(CX) U of Cal., Riverside
(CZ) Cal State U/Dominguez Hills
(DA) Desert Research Instit.
(DB) Div. of Conserv. Arch.
(DC) Denver University
(DD) Dept. of Env. Quality
(DE) David Darlington
(DF) Desert West
(DG) Dakota Research Services
(DH) Dames & Moore
(DI) Mary Dohnalek
(DJ) D. L Zurga and Associates
(DK) William C. Davis
(DL) Daggett & Chenault Inc.
(DN) Don Keller (freelance)
(DT) Intermtn. Arch., Donna Tumpseed
(DU) Dugway Proving Grounds
(DV)
(DW) Desert West, Carlsbad NM
(EA) Eastern New Mexico Univ.
(EB) Eastern Washington Univ.
(EC) Environmental Consultants
(ED) ESCA Tech
(EE) Environ. Res. Cntr. (DAS)
(EF) Ethnoscience
(EG) Environ. Studies Group
(EH) Ecosystems Resources, Inc (ERI)
(EI) Environmental Solutions Inc.
(EJ) Ebasco Environmental
(EK) Ecosystems Management Inc.
(EN) Environet

(EP) EarthTouch (Layton, UT)
(FA) Frontier Archeology
(FB) Fugro Northwest (ERTEC)
(FC) Flat Irons
(FD) Ft. Lewis
(FE) 4 Corners Archaeology
(FF) Far Western Anthropo. Res. Grp.
(FG) Fossil Butte Natl. Monument
(FH) Foothill Eng. Consultants
(FI) Affinis Environmental Serv.
(FJ) John Fritz, SLC
(FO) 4 Corners Schl. of Outdoor Ed.
(FS) Forest Service
(FW) Stillwater Nat'l Wildlife Refuge
(GA) Gordon & Kranzush
(GB) Grand River (Inst.)
(GC) Grand River (Consult.)
(GD) Gilbert/Commonwealth
(GE) J. & M. Greer Arch. Cons.
(GF) Goodson & Associates
(GG) GCM Services
(GH) Great Basin National Park
(GI) Great Basin Arch., Reno
(GM) Geo-Marine Inc., TX
(GO) GeoOpt Res/Reno
(GS) Greystone
(HA) Harvard University
(HB) High Plains
(HC) Heritage Museum
(HD) Historical Research Assoc.
(HE) Richard R. Harrison
(HF) Marvin Hoyt
(HG) Huerfano Consultants, Inc.
(HH) Heritage Research Ctr.
(HI) Hageman Fossilbeds Ntl. Mt.
(HJ) High Country Archaeology
(HL) Hill AFB (Env. Management)
(HN) Harding ESE, Carson City NV
(HQ) HRA Inc, Las Vegas
(HR) HDR Clenes, Santa Barbara
(HS) Historic Sites Research
(HU) Human Systems Research
(IA) Idaho Arch. Consultants
(IB) Idaho St. Highway Dept.
(IC) Idaho St. Hist. Society
(ID) Idaho St. University
(IE) Univ. of Idaho
(IF) Intermountain Research
(IG) Internat'l. Learning & Res.
(IH) Independ. Arch. Consult.
(II) Independent Archaeology
(IJ) Intermontane Arch. Assoc.
(IK) Idaho Museum of Nat. Hist.
(IL) Intermountain Resources
(IM) Independant Arch. Consultant
(IN) Idaho Power Company
(IQ) Intermountain Archae. Inc.
(IR) Infotec Research, Inc.
(IS) Archaeological Services Inc., Reno
(JA)
(JB) JBR Consultants, Reno
(JF) Frank W. Johnson
(JS) Jones and Stokes, Inc.
(KA) K.K. Pelli
(KB) Kantner-Smith
(KC) Peter Kiewit Sons
(KD) Kainer-Rodriquez Assoc.
(KE) Kail Consulting Ltd.
(KF) R. Kautz & Associates, Inc.
(KG) Knight & Leavitt Assoc. Inc.
(KI) Kinlani Arch. Ltd. (Flagstaff)
(KK) KLA Environmental, Las Vegas
(KL) KEA Environmental
(LA) La Plata Archaeological Consult.
(LB) Laramie Cult. Research
(LC) Llano Consultants
(LD) Lincoln Land Comm. College
(LE) Land Resources Technology
(LF) Auberg Cult. Res. Consult. Serv.
(LH) Lithic Technologies, Provo
(LM) Lone Mountain, Albuquerque
(LO) Lobdell and Assoc.
(LP) Alta Pleno Archaeology
(LS) Littlesnake Archae. Consult, WY
(LT) William R. Latadi & Assoc.
(LU) William R. Lucius
(MA) Metcalf-Zier Arch., Inc.
(MB) MESA
(MC) Mike Moen & Associates
(MD) Montgomery Engineers
(ME) Mariah Associates
(MF) Minerals Research Center
(MG) Douglas McKay
(MH) Montana State Univ.
(MI) Univ. of Montana
(MJ) Office of Surface Mining
(MK) Univ. of Missouri
(ML) Susan J. Miller
(MM) Metcalf Arch. Consultants
(MN) Middlefork Archaeology
(MO) Moore Anthropological Research
(MP) Peter B. Mires, NV
(MQ) Montgomery Arch. Consultants
(MR) Mari Pritchard-Parker, Los Angeles
(MW) Museum of Western Colorado
(NA) National Park Service
(NB) Nevada Arch. Survey
(NC) U of Nevada, Las Vegas

(ND) U of Nevada, Reno
(NE) Nevada State Museum
(NF) New Mexico State Univ.
(NG) New World Research
(NH) Nickens & Associates
(NI) Museum of N. Arizona
(NJ) Northland Anthro. Res.
(NK) Navajo Nation Cult. Res.
(NL) Nevada Dept. of Trans.
(NM) Native Cult.. Serv.
(NN) Univ. of Northern Colorado
(NO) Northern Arizona Univ.
(NP) A.K. Nielson & Assoc.
(NQ) Native Cultural Resource Serv.
(NR) Northwest Arch. Assoc., Inc.
(NS) National Spec. Soc.
(NT) Univ. of Nebraska
(NU) UNDAR-West (U. of N. Dakota)
(NV) North Platt Arch. Services
(NW) Niwot Archaeological Con.
(NX) Western Div. Naval Air Sta. Fallon
(NY) North Wind Env., Inc, Idaho Falls
(NZ) Nakonechny Archae, Pullman, WA
(N1) Archae. Investigations NW Inc.
(OA) Oil Well Elev. & Loc.
(OB) Overland Archeology, Inc.
(OE) Ogden Env. & Energy Serv., Boise
(PA) Powers Elevation
(PB) Professional Analysts
(PC) Private Contractor or Engineering Company
(PD) P-III Associates
(PE) Pioneer Arch. Consult.
(PF) Private Individual
(PG) Pronghorn Anthro. Assoc.
(PH) Paleo-Environmental
(PI) P/S Scientific
(PJ) Peak and Associates
(PK) Plano Arch. Consultants
(PL) Powder River Consultants
(PM) Barry Price
(PN) Patrick Engineering
(PO) Petrographics
(PP) University of Pittsburg
(PQ) Paragon Contractors
(PR) Plateau Resources
(PS) JPochteca Archaeology
(PT) Applied Paleoscience (Richmond)
(PV) Parr Environmental
(PX) PBS&J, Austin, TX
(RA) Mary P. Rossillon
(RB) Rocky Mt. Arch. Consult.
(RC) Charles Reher
(RD) Rosenberg Historical Consultants
(RE) Univ. Of Redlands
(RF) Resource Concepts, Inc.
(RG) Research Archaeology
(RH) R.K. Vierra & Assoc. Inc.
(RI) Rainbow Country Arch.
(RJ) Rare Earth Studies, Albuquerque
(RP) Arrowspace (Idaho Falls)
(RS) Rainshadow Res. Inc.
(RT) Renewable Technologies
(RW) Amer. Indian Rockwriting
(SA) San Juan Arch. Res. Cntr.
(SB) Science Applications
(SC) Senco-Phoenix
(SD) Smithsonian Institution
(SE) Southern Utah St. College
(SF) Snake River Arch./Hist.
(SG) San Jose State College
(SH) Soil Conservation
(SI) Soils System Inc.
(SJ) Sagebrush Arch. Consult.
(SK) Swanson and Associates
(SL) San Juan College Cult. Res. Management Program
(SM) Somona State University
(SN) J.F. Sato
(SO) Noel Logan, SEC Inc.
(SP) Southern Illinois University
(SQ) William Self & Associates
(SR) Statistical Research
(SS) Science Application Int. Corp.
(ST) SWCA Environmental Consult.
(SU) Southern Methodist U.
(SV) Salmon Archaoelogical Service
(SW) William T. Statham
(SX) S.L. Lahren, Jr.
(SY) Summit Envirosolutions
(SZ) Southwest Archaeo. Consultants
(TA) Tennessee Valley Authority
(TB) Larson Tibesar
(TC) Pat Treat
(TD) Tetra Tech
(TE) Tooele Army Depot
(TF) Terra Alta Archaeology
(TH) Cochetopa Arch. Cons., Ted Hoeler
(TR) Trigon Engineering Inc.
(TU) U Texas, Arlington
(UA) University of Utah
(UB) Utah Arch. Research Corp.
(UC) Utah St. Hist. Society
(UD) Utah State Parks
(UE) USGS
(UF) U.S. Army Corp. of Engineers
(UG) URS-Berger
(UH) Utah Rock Art Assoc.

(UI) U.R.S. Corp.
(UJ) Utah State University
(UK) U.S. Fish and Wildlife
(UL) Utah Div. of Oil Gas & Mining
(UM) Utah Div. of State Lands/Forestry
(UN) Utah Geological Survey
(UO) Sullivan Consultants
(UP) Uncompahgre, Grand J. CO
(US) Utah Statewide Archaeolog. Soc.
(UT) Utah State Dept. Transport.
(UW) USWest Research Inc., SLC
(UZ) U of Arizona
(WA) Univ. of Washington
(WB) Washington St. University
(WC) Weber State College
(WD) Westec Services, Inc.
(WE) Western Cultural Res.
(WF) Western Historical Studies
(WG) Woodward-Clyde
(WH) University of Wyoming
(WI) Wyoming Office State Arch.
(WJ) Worldwide Surveys
(WK) Western Wyoming College
(WL) Western Research
(WM) Western Arch. Consultants
(WN) Woods Canyon Arch. Consult.
(WO) Water and Power Resources
(WP) Wyoming Arch. Society
(WQ) Wyoming Rec. Commission
(WR) Western Heritage Conserv.
(WS) Western Interp. Services
(WT) W.G. Consultants
(WU) White Mesa Institute (CEU)
(WV) Western Prehist. Research
(WW) Western Public Hist.. Assoc.
(WX) West. Public Hist. Consortium
(WY) White Pines Pub. Museum
(WZ) Desert West Research
(W1) Les Wykle (independent)
(W2) F.E. Warren AFB
(W3) White Sands AFB
(W4) Windriver Res. Management
(W5) West. Cultural Inc, Missoula
(W6) Western Archae. Services Inc., WY
(W7) WAPA (West. Area Power Admin.)
(ZA) George Zeimens
(ZI) Archaological Invest. NW Inc.
(ZT) Aztlan Arch. Inc., Tucson
(ZU) Arizona State U

310 - PART A, ADMINISTRATIVE DATA:

*1. STATE SITE NUMBER: 

Always fill in State and County codes. Leave number blank until supplied by State Preservation Office.

(04)	California	(26)	Nevada	(10)	Idaho
(AP)	Alpine	(CH)	Churchill	(AA)	Ada
(LS)	Lassen	(CK)	Clark	(AM)	Adams
(MZ)	Mono	(DO)	Douglas	(BK)	Bannock
(PU)	Plumas	(EK)	Elko	(BL)	Bear Lake
(SE)	Sierra	(ES)	Esmeralda	(BW)	Beneway
		(EU)	Eureka	(BM)	Bingham
(42)	Utah	(HU)	Humboldt	(BN)	Blaine
(BE)	Beaver	(LA)	Lander	(BO)	Boise
(BO)	Box Elder	(LN)	Lincoln	(BR)	Bonner
(CA)	Cache	(LY)	Lyon	(BV)	Bonneville
(CB)	Carbon	(MN)	Mineral	(BY)	Boundary
(DA)	Daggett	(NY)	Nye	(BT)	Butte
(DV)	Davis	(OR)	Carson City	(CM)	Camas
(DC)	Duchesne	(PE)	Pershing	(CN)	Canyon
(EM)	Emery	(ST)	Storey	(CU)	Caribou
(GA)	Garfield	(WA)	Washoe	(CA)	Cassia
(GR)	Grand	(WP)	White Pine	(CL)	Clark
(IN)	Iron			(CW)	Clearwater
(JB)	Juab			(CR)	Custer
(KA)	Kane	(48)	Wyoming	(EL)	Elmore
(MD)	Millard	(AB)	Albany	(FR)	Franklin
(MO)	Morgan	(BH)	Big Horn	(FM)	Fremont
(PI)	Piute	(CA)	Campbell	(GM)	Gem
(RI)	Rich	(CR)	Carbon	(GG)	Gooding
(SL)	Salt Lake	(CO)	Converse	(IH)	Idaho
(SA)	San Juan	(CK)	Crook	(JF)	Jefferson
(SP)	Sanpete	(FR)	Fremont	(JE)	Jerome
(SV)	Sevier	(GO)	Goshen	(KA)	Kootenai
(SM)	Summit	(HO)	Hot Springs	(LT)	Latach
(TO)	Tooele	(JO)	Johnson	(LH)	Lemhi
(UN)	Uintah	(LA)	Laramie	(LE)	Lewis
(UT)	Utah	(LN)	Lincoln	(LN)	Lincoln
(WA)	Wasatch	(NA)	Natrona	(MO)	Madison
(WS)	Washington	(NO)	Niobrara	(MA)	Minidoka
(WN)	Wayne	(PA)	Park	(NP)	Nez Perce
(WB)	Weber	(PL)	Platte	(OA)	Oneida
		(SH)	Sheridan	(OE)	Owyhee
		(SU)	Sublette	(PE)	Payette
		(SW)	Sweetwater	(PR)	Power
(05)	Colorado	(TE)	Teton	(SE)	Shoshone
(ME)	Mesa	(UT)	Uinta	(TF)	Twin Falls
(MN)	Montrose	(WA)	Washakie	(VY)	Valley
		(WE)	Weston	(WN)	Washington
		(YE)	Yellowstone		

*2. AGENCY NUMBER: Nevada BLM and USFS sites only, as assigned by agency.

Forest - Site Number
or
BLM Districts and
Resource Area

Forest Codes: (Proclaimed Forest)

(AS)	Ashley	(DX)	Dixie	(SL)	Salmon
(BR)	Bitteroot	(FL)	Fishlake	(SW)	Sawtooth
(BS)	Boise	(HM)	Humboldt	(TG)	Targhee
(BT)	Bridger-Teton	(ML)	Manti-LaSal	(TY)	Toiyabe
(CB)	Caribou	(NP)	Nez Perce	(UN)	Uinta
(CH)	Challis	(PY)	Payette	(WS)	Wasatch
(BH)	Bighorn	(MB)	Medicine Bow	(SH)	Shoshoni
(BL)	Black Hills	(TB)	Thunder Basin		

Nevada BLM District/Resource Area

Elko		Winnemucca	
(11)	Wells	(21)	Paradise-Denio
(12)	Elko	(22)	Sonoma-Gerlach

Carson City		Ely	
(31)	Lahontan	(46)	Egan
(32)	Walker	(47)	Schell

Las Vegas		Battle Mountain	
(51)	Caliente	(61)	Tonopah
(52)	Virgin Valley	(62)	Shoshone
(53)	Stateline	(63)	Eureka
(54)	Esmeralda		

3. TEMP SITE NO.: Use this category for temporary site field numbers.

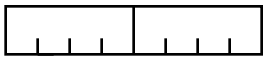
4. STATE: Enter the name of the state in which the site is located.

   COUNTY: Enter the county.

5. PROJECT: Enter the name of impacting project, if any.

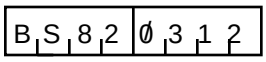
*6. REPORT NUMBER. For USFS, Nevada BLM, each agency has its own number format but will use the same encoding block, as indicated below. In Utah, this entry is reserved for Project I.D.

USFS:

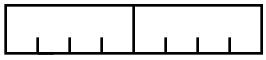


Forest/Year - Report No.

Use the same Forest codes as shown in item A2.
Ex: Boise NF, report #312, 1982 =

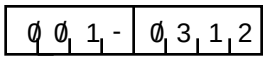


BLM:



District (hyphen) Report No.

Use the same district codes as shown in item A2.
Ex: Elko District, report #312 =



7. SITE NAME/PROPERTY NAME: Enter any popular names or designations for this site, if any Property names are known historic property names, not current owner's names. Include references to any previous site publications or informants, if applicable. Enter the first 25 characters, including blank spaces, into A35.

8. CLASS: Check as appropriate. (Paleontological, Prehistoric, Historic Ethnographic). Many sites require that more than one class be checked.

9. SITE TYPE: Short description of site.

*10. ELEVATION: Record the elevation in feet as determined from the USGS topographical map (if available). Zero fill in all blanks and right justify.

Example: 5600' = | Ø | 5 | 6 | Ø | Ø |

*11. UTM GRID: Using a USGS map and standard UTM calculator, locate the site's position within the Universal Transverse Mercator Grid System. For small sites, indicate the centerpoint only, for sites over 4Ø acres or linear sites (trails, canals, etc.), enter multiple UTMs in item A36 of the site form and use multiple entries in part A11 of the encoding form. Enter up to 4 UTM locations, as appropriate. (Multiple entry of UTMs is optional.)

CAUTION: ALL SPACES IN THE UTM ENCODING BLOCK MUST BE FILLED, OR YOU HAVE MADE AN ERROR. EASTINGS CONTAIN 6 CHARACTERS, NORTHINGS 7 CHARACTERS. BE SURE UTM COORDINATES ARE ACCURATE.

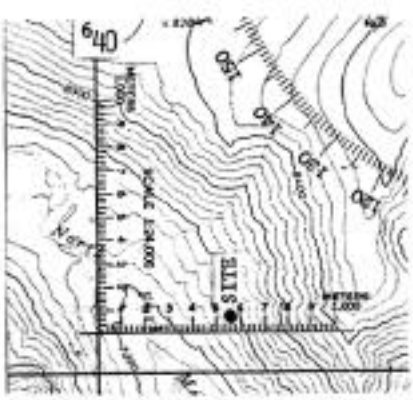
Procedure For Calculating UTMs

1. Find your point on the map.

2. With the straightedge, carefully draw a line from the top of the map to the bottom, connecting the two blue UTM ticks immediately west of the point. Make sure the ticks are a correct pair (have the same value).

3. Do the same for the pair of ticks immediately south of the point; draw a line from the left to the right side of the map. This will intersect your first line somewhere to the southwest of the point (Figure 1).

4. Record the UTM zone number.



The UTM calculator shows that this point is 560 meters east of the line, or UTM 640560m E.

Figure 1 - USGS map with lines drawn to connect UTM ticks. The lines intersect southwest of the point.

5. Record the easting and northing values of the drawn lines. In our example (Fig. 4), this would be 640___ m. E. and 4987___ m. N. (If this is unclear, refer to section 485.) These are the first digits of your complete UTM location; the last three digits will be measured with the plastic UTM calculator.

6. Find the scale on the UTM calculator which matches the scale on the bottom of your map. The two most common scales are 1:24,000 (7.5 minute) and 1:62,500 (15 minute).

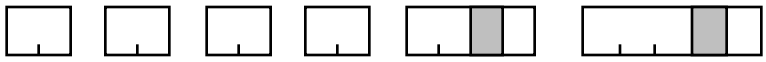
7. Using the UTM calculator, measure how far east the point is from the north-south line you drew. Record this as the last three digits of the easting value. The point in Figure 2 is 560 meters east of the line. Thus, the complete easting value is 640 560 m. E.

8. Repeat the process, measuring from the point to the east-west line to obtain the complete northing value.

Figure 2 - The UTM calculator shows that this point is 560 meters east of the line, or UTM 640 560 m E.

For more detailed instructions on how to calculate UTMs, refer to Section 485, UTM Instructions.

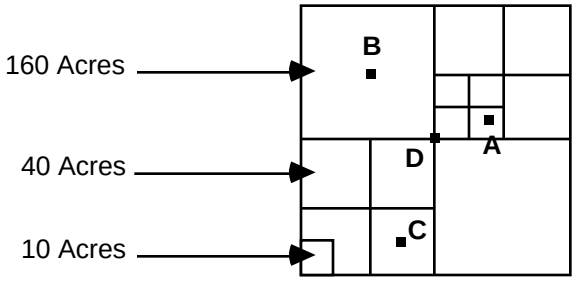
*12. TOWNSHIP AND RANGE 1: Locate the site to the nearest 10 acre subdivision. If a site is large or straddles section or township lines, describe the situation in part A36 of the site form and use multiple entries in part A12 of the encoding sheet. For site locations, use the following procedure to standardize template use: 1) Anchor template on SE corner, 2). Alternative positioning is the NW corner. If the second positioning or any other positioning is used, please note on the site form how the location was determined. Enter up to 4 Township and Range locations, as appropriate. If the section is not the standard 640 acre plot, divide the section into quarters based on its actual dimensions instead of using templates.



Location codes for 10, 40, & 160 acre subdivisions. Section Township Range

Examples: T. 5N., R. 13 E., Section 6

Subdivision Codes
(NE) Northeast
(SE) Southeast
(NW) Northwest
(SW) Southwest
(CT) Center



(*Not to be used for 10 acre subdivisions)

Example A	S	E	S	W	N	E	0	6	0	5		N	0 1 3		E
Example B			C	T	N	W	0	6	0	5		N	0 1 3		E
Example C	C	T	S	E	S	W	0	6	0	5		N	0 1 3		E
Example D					C	T	0	6	0	5		N	0 1 3		E
Half Township/Range	N	W	S	W	S	E	0	6	0	5	**5**	N	0 1 3	**5**	E

12a. STREET/ADDRESS: Enter the street and address for Historic sites (where applicable).

*13. MERIDIAN: Enter the code for your base meridian.

Meridian Codes:

(1) SLC (Utah)
(2) Uintah (Utah)
(3) Boise (Idaho)
(4) 6th Principal (Wyoming)
(5) Wind River (Wyoming)
(6) New Mexico 6th
(7) Mt. Diablo (Nevada)
(8) San Bernadino (California)
(9) Willamette (Oregon)

*14. MAP REFERENCE: Record the name of the USGS map series (7.5' or 15') for the area where the site is located. In the case where no USGS maps are available, indicate the type of map used. For encoding, (USGS maps only) please enter the first 20 characters of the name of the USGS map. Leave a blank space between two words in the map name. If the map name exceeds 20 characters in length, please truncate the entry after 20 characters. If the map in question is one of a series (i.e., an old 15 minute map split into SE, NE, NW, SW Quadrats) and the map name exceeds 20 characters, please enter the first 18 characters of the map name and use the remaining 2 characters to identify the specific map (i.e., SE, NE, etc.). If site is on 2 USGS maps, enter the map containing the majority of the site. Enter the map name exactly as it is written on the map, including punctuation and spaces.

15. AERIAL PHOTO DATA: When applicable, record the numerical designator, series, and date (if available) of aerial photos used to locate the site.

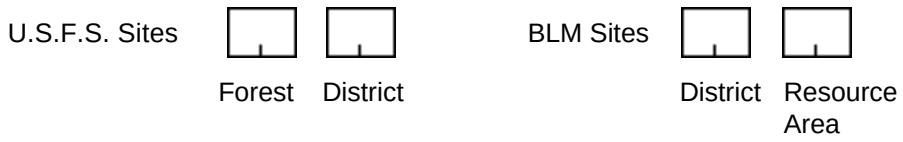
16. GENERAL LOCATION AND ACCESS: Describe the site location relative to local landforms and to prominent natural features (e.g., mountains, streams, cliffs, etc.), as well as cultural features (e.g., roads, towns, power lines, etc.). This description should be accurate enough to help a future surveyor relocate the site. Include road mile numbers and river mile numbers, if appropriate. Begin with a general reference to the area's most notable landmark; e.g., approximately 5 miles east of Jackson Hole. Then get more specific.

*17. LANDOWNER: Enter land ownership as it corresponds to Township and Range entry. For those large sites that span ownership boundaries, enter the predominant owner and describe the situation in A-36 on the encoding form.

Owner Codes:

(BR) Bureau of Rec.
(CI) City
(CO) County
(FS) USFS
(FW) Fish & Wildlife
(IR) Indian Reservation
(LM) BLM
(MR) Military Reservation
(PS) Park Service
(PR) Private
(SE) Split Estate
(ST) State
(OT) Other
(ZZ) Unknown

*18. FEDERAL ADMINISTRATIVE UNITS: For all sites on USFS and BLM lands, fill in both encoding blocks. For NPS sites, fill in the first block only. Note that for the BLM "District" is a state subdivision; for the USFS, it is a Forest subdivision.



BLM District Codes:

UTAH - BLM
(B2) Salt Lake
(B4) Cedar City
(B5) Richfield
(B6) Moab
(B8) Vernal

WYOMING - BLM
(W1) Rock Springs
(W2) Worland
(W3) Rawlins
(W4) Casper

NEVADA - BLM
(BA) Ely
(BB) Elko
(BC) Las Vegas
(BD) Battle Mountain
(BE) Winnemucca
(BF) Carson City

IDAHO - BLM
(BG) Boise District
(BH) Burley
(BI) Idaho Falls
(BJ) Salmon
(BK) Shoshone
(BL) Cottonwood (Res. Area Office)

CALIFORNIA
(SU) Susanville

*18. FEDERAL ADMINISTRATIVE UNITS (continued)

BLM Resource Area Codes:

IDAHO:

Boise: Burley:
(A6) Cascade
(A7) Owyhee
(A8) Bruneau
(A9) Jarbidge

Idaho Falls:
(B5) Snake River
(B9) Deep Creek

(C6) Big Butte
(C7) Medicine Lodge
(C9) Pocatello

Salmon:
(D6) Challis
(D8) Lemhi

Shoshone:
(E6) Monument
(E7) Bennett Hills

Coeur d'alene:
(F6) Emerald Empire
(F7) Cottonwood

UTAH:

Salt Lake:
(G6) Bear River
(G7) Pony Express

Cedar City:
(H6) Beaver River
(H7) Dixie
(H8) Kanab
(H9) Escalante

Richfield:
(I6) House Range
(I7) Warm Springs
(I8) Sevier
(I9) Henry Mountain

Moab: Vernal:
(J6) Price River
(J7) San Rafael
(J8) Grand
(J9) San Juan

(K6) Diamond Mountain
(K7) Book Cliffs

WYOMING:

Worland:
(L1)Grass Creek
(L2)Washakie
(L3)Cody

Rawlins:
(M1)Lander
(M2)Divide
(M3)Medicine Bow
(M4)Great Divide

Rock Springs:
(N1)Pinedale
(N2)Kemmerer
(N3)Green River

Casper:
(P1) Buffalo
(P2) Platte River
(P3) Newcastle

CALIFORNIA:

Susanville:
(Q1) Surprise
(Q2) Eagle Lake
(Q3) Alturas

Forest Codes: (Administrative Forest)

(01) Ashley
(02) Boise
(03) Bridger-Teton
(05) Caribou
(06) Challis
(07) Dixie
(08) Fishlake
(09) Humboldt
(10) Manti-LaSal
(12) Payette
(13) Salmon
(14) Sawtooth
(15) Targhee
(17) Toiyabe
(18) Uinta
(19) Wasatch
(20) Nezperce
(21) Bitterroot
(22) Bighorn
(23) Medicine Bow
(24) Shoshoni
(25) Black Hills
(26) Thunder Basin
(27) Lake Tahoe

*18. FEDERAL ADMINISTRATIVE UNITS (continued)

USFS District Codes:

Ashley
(01) Flaming Gorge
(02) Vernal
(03) Roosevelt
(04) Duchesne

Caribou
(17) Soda Springs
(18) Montpelier
(19) Malad
(20) Pocatello

Challis
(21) Middle Fork
(22) Challis
(23) Yankee Fork
(24) Lost River

Dixie
(25) Pine Valley
(26) Cedar City
(27) Powell
(28) Escalante
(29) Teasdale

Fishlake
(30) Fillmore
(31) Loa
(32) Beaver
(33) Richfield

Humboldt
(34) Mountain City
(35) Ruby Mountains
(36) Jarbidge
(37) White Pine
(38) Santa Rosa
(39) Ely

Boise
(05) Mountain Home
(06) Boise
(07) Idaho City
(08) Cascade
(09) Lowman
(10) Emmett

Manti-LaSal
(40) Sanpete
(41) Ferron
(42) Price
(43) Moab
(44) Monticello

Payette
(45) Council
(46) Weiser
(47) New Meadows
(48) McCall
(49) Big Creek
(50) Krassel

Salmon
(51) Cobalt
(52) North Fork
(53) Leadore
(54) Salmon

Sawtooth
(55) Burley
(56) Twin Falls
(57) Ketchum
(58) Fairfield
(59) Sawtooth NRA

Bridger-Teton
(11) Kemmerer
(12) Big Piney
(13) Greys River
(14) Hoback
(15) Gros Ventre
(16) Buffalo
(79) Pinedale

Targhee
(60) Dubois
(61) Island Park
(62) Ashton
(63) Palisades
(64) Teton Basin

Toiyabe
(65) Carson
(66) Bridgeport
(67) Austin
(68) Tonopah
(69) Las Vegas

Uinta
(70) Heber
(71) Pleasant Grove
(72) Spanish Fork

Wasatch - Cache
(73) Salt Lake
(74) Kamas
(75) Evanston
(76) Mountain View
(77) Ogden
(78) Logan

Nezperce
(80) Red River

Bitterroot
(81) West Fork

USFS District Codes:

Black Hills
(97) Bearlodge
(98) Elk Mtn.
(99) Spearfish

Medicine Bow
(87) Brush Creek
(88) Hayden
(89) Laramie

(90) Laramie Peak
(91) Thunder Basin

Shoshoni
(92) Clarks Fork
(93) Greybull
(94) Lander
(95) Wapiti
(96) Wind River

Big Horn
(82) Buffalo
(83) Medicine Wheel
(84) Paint Rock
(86) Tongue
(85) Tensleep

National Park Service Park Codes:

UTAH - NPS
(AR) Arches
(BR) Bryce
(CA) Canyonlands
(CR) Capitol Reef
(CB) Cedar Breaks
(DI) Dinosaur
(GL) Glen Canyon
(GO) Golden Spike
(NB) Natural Bridges
(TC) Timpanogos Cave
(XI) Zion

WYOMING - NPS

(DT)	Devils Tower	(FL)	Fort Laramie	(JR)	John D. Rockefeller
(FB)	Fossil Butte	(GT)	Grand Teton	(YE)	Yellowstone

*18. FEDERAL ADMINISTRATIVE UNITS (continued)

IDAHO - NPS
(CM) Craters of the Moon

NEVADA - NPS
(GB) Great Basin National Park
(LM) Lake Mead National Recreation Area

19. LOCATION OF CURATED MATERIALS

(AMH)American Museum of Natural History
(AHC)Anasazi Hertitage Center
(ANP)Anasazi State Park
(AIP)Antelope Island State Park
(ASM)Arizona State Museum
(CFP)Camp Floyd State Park
(CNP)Canyonlands National Park
(CCM)Churchill County Museum
(UCM)University of Colorado Museum
(CPP)Coral Pink State Park
(DHP)Dead Horse Point State Park
(DRI)Desert Research Institute, UNR
(DLC)James Dickinson Lib. Spec. Collections, UNR
(DNH)Dinosaur Natural History Museum
(ECM)Emery County Museum
(ECP)Edge of the Cedars State Park
(ESP)Escalante State Park
(FBP)Fort Buenaventura State Park
(FHP)Utah Field House State Park
(FIP)Fremont Indian State Park
(GLC)Getchell Library Special Collections, UNR
(HFN)Heye Foundation, NYC
(IHS)Idaho State Historical Society
(IMP)Iron Mission State Park
(ISU)Southeastern Idaho Regional Arch. Ctr.
(LCM)Lost City Museum State Park
(LMB)Lowie Museum, UC Berkeley
(MEC)Mesa College
(MNP)Mesa Verde National Park
(MAC)Midwest Archaeological Center
(MOM)Moab Museum (Dan O'Laurie Museum)
(MNA)Museum of Northern Arizona
(MPC)Museum of Peoples & Cultures (BYU)
(NHS)Nevada Historical Society
(NMH)UNLV Museum of Natural History
(NAT)Navajo Tribe
(NSM)Nevada State Museum
(NAU)Northern Arizona University
(PHM)Prehistoric Museum (College of E. Utah)
(PRM)John Wesley Powell River Museum
(PTP)Pioneer Trail State Park
(SCP)Snow Canyon State Park
(SCR)Southwestern Cultural Resource Ctr.
(SMI)Smithsonian Institution
(SNM)Southern Nevada State Mus. & Hist. Soc.
(STC)Stillwater Crypt
(SWM)Southwest Museum
(SUS)Southern Utah State College
(TAM)A. Treganza Anthro. Mus., SF State Univ.
(TSP)Territorial State House State Park
(UCD)UC Davis Dept. of Anthropology
(UCL)UCLA Dept. of Anthropology
(UCR)UC Riverside Dept. of Anthropology
(UFH) Utah Fieldhouse of Natural History
(UIM)Northern Idaho Regional Arch. Ctr.
(ULK)University of Louisville
(UMH)Utah Museum of Natural History
(UNM)Univ. of New Mexico(Lab. of Anthro.)
(UNR)UNR Museum of Anthropology19.
(USU)Utah State University
(UWL)University of Wyoming, Laramie
(WMP)Wasatch Mountain State Park
(WAS)Washington State University
(WSU)Weber State University
(WAC)Western Archaeological Center
(WWC)West. Wyoming College, Rock Springs
(ZNP) Zion National Park

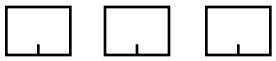
20. SITE DESCRIPTION: Describe the site in detail and, if needed, continue the discussion on continuation sheets.

*21. SITE CONDITION:

Codes:

(A) Excellent - virtually undisturbed
(B) Good - 75 percent undisturbed
(C) Fair - 50-75 percent undisturbed
(D) Poor - more than 50 percent disturbed
(E) Inundated - covered with water
(F) Destroyed - no longer exists
(Z) Unknown - no information available

*22. IMPACT AGENTS: Enter actual agents of impact only, not anticipated impacts. There is room for three impacts. Fill in the blocks from left to right.



Codes:

(AG)	Agricultural Use	(MA)	Major Building Alteration	(RC)	Recreation Use
(CE)	Completed Excavation	(MI)	Minor Building Alteration	(RD)	Road
(CL)	Clear Cutting	(MN)	Mining	(RE)	Research Excavation
(DE)	Deflation	(NO)	No Impact	(RO)	Rodent Damage
(DM)	Demolition/Dismantling	(NI)	No Information	(RV)	Recreational Vehicle
(ER)	Erosion	(OT)	Other	(SD)	Structural Decay
(GR)	Grazing	(PR)	Development Project	(VA)	Vandalism

*23. NATIONAL REGISTER STATUS:

TO BE ENCODED BY PERMITTED ARCHAEOLOGISTS OR CERTIFIED CREW CHIEFS ONLY. Indicate the appropriate code and provide a statement to justify your recommendation. Make every possible effort to evaluate the site, but if a recommendation cannot be made, use undetermined (Z) rather than leaving it blank.

Codes:

(A) National Register Listed Site
(B) Nominated for National Register
(C) National Register Quality (Professional Judgement)
(D) Non-significant (Professional Judgement)
(E) Other
(F) Registered as part of National Register District
(G) National Register Site but no longer exists
(H) National Historic Landmark
(I) Determined Eligible (SHPO concurrence)
(J) Determined Eligible, owner objection (SHPO Concurrence)
(O) Other Register
(Z) Undetermined

23a. EVALUATION LEVEL: (management use only).

24. PHOTOGRAPH NUMBERS: Include the photo numbers in whatever system your survey organization uses. Indicate where your photo negative is stored.

25. RECORDED BY: Record the name of the person(s) responsible for the site record.

*26. SURVEY ORGANIZATION: If your organization has no code, call the University of Utah, Archaeological Center (801) 581-8663.

Survey Organization Codes

(AA)	J.P. Albanese
(AB)	Anthro Research, Inc.
(AC)	Am. Museum of Nat. His.
(AD)	Archeological Associates
(AE)	Arch. Research Assoc.
(AF)	Arch. Environ. Res. Corp.
(AG)	Archeological Rescue
(AH)	Arch. Services
(AI)	Arizona State Museum
(AJ)	Arizona State Park
(AK)	ARCON
(AL)	Ancient Enterprises, Inc.
(AM)	Archeological Consultants
(AN)	Archeo Consultants
(AO)	Archaeological Energy
(AP)	Argonne National Lab.
(AQ)	Arch. Consultants (Worland)
(AR)	Arch. Research Services
(AS)	Abajo Archaeology
(AT)	AR Consultants
(AU)	Antiquus
(AV)	Agency of Conserv. Arch.
(AW)	American Arch. Consultants
(AX)	Applied Archaeology Consult.
(AY)	An Independent Archaeologist
(AZ)	Anonymous
(A1)	Alpine Arch. Consult. Inc.
(A2)	Ancient America Foundation
(A3)	Archaeological Consulting Serv.
(A4)	Antonette Chambers Noble
(A5)	Advance Sciences, Inc.
(A6)	Archae. Res. of Southern Nevada
(A7)	Adams and Associates
(BA)	Basin Research
(BB)	Boise State University
(BC)	Brigham Young University
(BD)	Bristlecone, Inc.
(BE)	Bureau of Reclamation
(BF)	Burgess and Associates
(BG)	Burney & Associates
(BH)	Buffalo Bill Historical Center
(BI)	Bureau of Indian Affairs
(BJ)	James Brechtel
(BL)	BLM
(BM)	B.R. Butter, Assoc.
(BN)	Bighorn Basin Consulting
(BO)	B.C. Services
(BR)	Basin and Range Research
(CA)	U of Calif., Berkeley
(CB)	U of Calif., Davis
(CC)	U of Calif., L.A.
(CD)	Centuries Research
(CE)	Chambers Group, Inc
(CF)	Colorado State Univ.
(CG)	State of Colorado
(CH)	Complete Archaeology
(CI)	Cult. Res. Consultants
(CJ)	University of Colorado
(CK)	Cal. State College
(CL)	Chambers Group, Inc.
(CM)	Univ. of N. Colorado
(CN)	Centennial Archeology
(CO)	Cent. Washington Arch. Surv.
(CP)	Cultural Reserch/Management
(CQ)	Fred Chapman
(CR)	Crouch, J.R.
(CS)	Crow Canyon Center For Southwestern Arch.
(CT)	College of Eastern Utah
(CU)	Cultural Resource Group
(CV)	D. & J. Chance & Associates
(CX)	U of Cal., Riverside
(DA)	Desert Research Instit.
(DB)	Div. of Conserv. Arch.
(DC)	Denver University
(DD)	Dept. of Env. Quality
(DE)	David Darlington
(DF)	Desert West
(DG)	Dakota Research Services
(DH)	Dames & Moore
(DI)	Mary Dohnalek
(DJ)	D. L Zurga and Associates
(DK)	William C. Davis
(DL)	Daggett & Chenault Inc.
(EA)	Eastern New Mexico Univ.
(EB)	Eastern Washington Univ.
(EC)	Environmental Consultants
(ED)	ESCA Tech
(EE)	Environ. Res. Cntr. (DAS)
(EF)	Ethnoscience
(EG)	Environ. Studies Group
(EH)	Ecosystems Resources, Inc (ERI)
(EI)	Environmental Solutions Inc.
(EJ)	Ebasco Environmental
(FA)	Frontier Archeology
(FB)	Fugro Northwest (ERTEC)
(FC)	Flat Irons
(FD)	Ft. Lewis
(FE)	4 Corners Archaeology
(FF)	Far Western Anthropo. Res. Grp.
(FS)	Forest Service
(FW)	Stillwater Nat'l Wildlife Refuge
(GA)	Gordon & Kranzush
(GB)	Grand River (Inst.)
(GC)	Grand River (Consult.)
(GD)	Gilbert/Commonwealth
(GE)	J. & M. Greer Arch. Cons.
(GF)	Goodson & Associates

*26. SURVEY ORGANIZATION: continued.

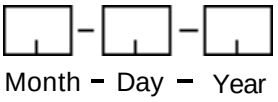
(GG) GCM Services
(GH) Great Basin National Park
(HA) Harvard University
(HB) High Plains
(HC) Heritage Museum
(HD) Historical Research Assoc.
(HE) Richard R. Harrison
(HF) Marvin Hoyt
(HG) Huerfano Consultants, Inc.
(HH) Heritage Research Ctr.
(IA) Idaho Arch. Consultants
(IB) Idaho St. Highway Dept.
(IC) Idaho St. Hist. Society
(ID) Idaho St. University
(IE) Univ. of Idaho
(IF) Intermountain Research
(IG) Internat'l. Learning & Res.
(IH) Independ. Arch. Consult.
(II) Independent Archaeology
(IJ) Intermontane Arch. Assoc.
(IK) Idaho Museum of Nat. Hist.(IL) Intermountain Resources
(IM) Independant Arch. Consultant
(IN) Idaho Power Company
(IR) Infotec Research, Inc.
(JF) Frank W. Johnson
(KA) K.K. Pelli
(KB) Kantner-Smith
(KC) Peter Kiewit Sons
(KD) Kainer-Rodriquez Assoc.
(KE) Kail Consulting Ltd.
(KF) R. Kautz & Associates, Inc.
(KG) Knight & Leavitt Assoc. Inc.
(LA) La Plata Archaeological Consult.
(LB) Laramie Cult. Research
(LC) Llano Consultants
(LD) Lincoln Land Comm. College
(LE) Land Resources Technology
(MA) Metcalf-Zier Arch., Inc.
(MB) MESA
(MC) Mike Moen & Associates
(MD) Montgomery Engineers
(ME) Mariah Associates
(MF) Minerals Research Center
(MG) Douglas McKay
(MH) Montana State Univ.
(MI) Univ. of Montana
(MJ) Office of Surface Mining
(MK) Univ. of Missouri
(ML) Susan J. Miller
(MM) Metcalf Arch. Consultants
(MN) Middlefork Archaeology
(MO) Moore Anthropological Research
(NA) National Park Service
(NB) Nevada Arch. Survey
(NC) U of Nevada, Las Vegas
(ND) U of Nevada, Reno
(NE) Nevada State Museum
(NF) New Mexico State Univ.
(NG) New World Research
(NH) Nickens & Associates
(NI) Museum of N. Arizona
(NJ) Northland Anthro. Res.
(NK) Navajo Nation Cult. Res.
(NL) Nevada Dept. of Trans.
(NM) Native Cult.. Serv.
(NN) Univ. of Northern Colorado
(NO) Northern Arizona Univ.
(NP) A.K. Nielson & Assoc.
(NQ) Native Cultural Resource Serv.
(NR) Northwest Arch. Assoc., Inc.
(NS) National Spec. Soc.
(NT) Univ. of Nebraska
(NU) UNDAR-West (U. of N. Dakota)
(NV) North Platt Arch. Services
(NW) Niwot Archaeological Con.
(OA) Oil Well Elev. & Loc.
(OB) Overland Archeology, Inc.
(PA) Powers Elevation
(PB) Professional Analysts
(PC) Private Contractor or Engineering Company
(PD) P-III Associates
(PE) Pioneer Arch. Consult.
(PF) Private Individual
(PG) Pronghorn Anthro. Assoc.
(PH) Paleo-Environmental
(PI) P/S Scientific
(PJ) Peak and Associates
(PK) Plano Arch. Consultants
(PL) Powder River Consultants
(PM) Barry Price
(PN) Patrick Engineering
(PO) Petrographics
(PP) University of Pittsburg
(PR) Pleatau Resources
(RA) Mary P. Rossillon
(RB) Rocky Mt. Arch. Consult.
(RC) Charles Reher
(RD) Rosenberg Historical Consultants
(RE) Univ. Of Redlands
(RF) Resource Concepts, Inc.
(RG) Research Archaeology
(RH) R.K. Vierra & Assoc. Inc.
(RT) Renewable Technologies
(RW) Amer. Indian Rockwriting

*26. SURVEY ORGANIZATION: continued.

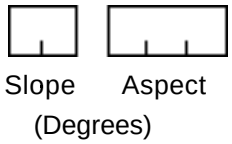
(SA) San Juan Arch. Res. Cntr.
(SB) Science Applications
(SC) Senco-Phoenix
(SD) Smithsonian Institution
(SE) Southern Utah St. College
(SF) Snake River Arch./Hist.
(SG) San Jose State College
(SH) Soil Conservation
(SI) Soils System Inc.
(SJ) Sagebrush Arch. Consult.
(SK) Swanson and Associates
(SL) San Juan College Cult. Res. Management Program
(SM) Somona State University
(SN) J.F. Sato
(SO) Noel Logan, SEC Inc.
(SP) Southern Illinois University
(SQ) William Self & Associates
(SR) Statistical Research
(SS) Science Application Int. Corp.
(SU) Southern Methodist U.
(TA) Tennessee Valley Authr.
(TB) Larson Tibesar
(TC) Pat Treat
(TD) Tetra Tech
(TE) Tooele Army Depot
(UA) University of Utah
(UB) Utah Arch. Research Corp.
(UC) Utah St. Hist. Society
(UD) Utah State Parks
(UE) USGS
(UF) U.S. Army Corp. of Engineers
(UG) URS-Berger
(UH) Utah Rock Art Assoc.
(UI) U.R.S. Corp.
(UJ) Utah State University
(UK) U.S. Fish and Wildlife
(UL) Utah Div. of Oil Gas & Mining
(UM) Utah Div. of State Lands/Forestry
(US) Utah Statewide Archaeolog. Soc.
(WA) Univ. of Washington
(WB) Washington St. University
(WC) Weber State College
(WD) Westec Services, Inc.
(WE) Western Cultural Res.
(WF) Western Historical Studies
(WG) Woodward-Clyde
(WH) University of Wyoming
(WI) Wyoming Office State Arch.
(WJ) Worldwide Surveys
(WK) Western Wyoming College
(WL) Western Research
(WM) Western Arch. Consultants
(WN) Woods Canyon Arch. Consult.
(WO) Water and Power Resources
(WP) Wyoming Arch. Society
(WQ) Wyoming Rec. Commission
(WR) Western Heritage Conserv.
(WS) Western Interp. Services
(WT) W.G. Consultants
(WU) White Mesa Institute (CEU)
(WV) Western Prehist. Research
(WW) Western Public Hist.. Assoc.
(WX) West. Public Hist. Consortium
(ZA) George Zeimens

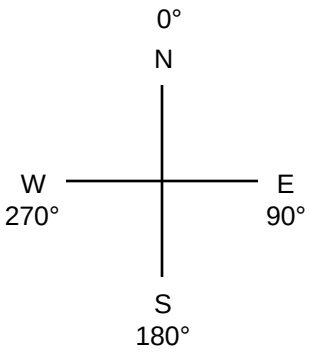
27. ASSISTING CREW MEMBERS: List names of assisting archeologists.

28. DATE OF SURVEY: Enter the date you recorded or re-visited the site.



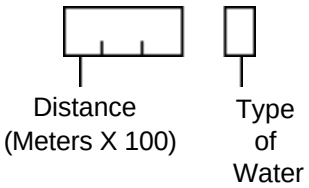
*29. SLOPE: Enter the approximate degree (from horizontal) of slope and the downward direction of the slope (or aspect.) If the site is absolutely level, indicate that there is no slope. The slope of sites on ridge crests should be recorded according to the slope down that ridge crest. The slope of sites on the sides of ridges should be recorded according to the downward slope of that side. Use the code 98 for a complex slope. Use 0 for a north aspect, and 998 for no aspect.





*30. DISTANCE TO WATER: Identify the nearest permanent natural water source. Refer to a USGS map if necessary. Record the distance to the nearest 100 meters, type of water, and name, if known.

If the site is on the water, use 0, if between 0 and 100 meters use 1



Example: Stream 1475 meters from site = 0 1 5 B

Codes:	Unknown(999) On-site	(998)	(999) -	(Z) -	or leave blank
Spring/seep	-	-	(A)		
Stream/river	-	-	(B)		
Lake	-	-	(C)		
*Other	-	-	(D)		

*31. GEOGRAPHIC UNIT: For the codes in Nevada refer to the map of Static Ground Water Levels of Nevada, Division of Water Resources, State Engineers Office, 1974.

Geographic Unit Codes for Nevada: (Please note that all of Nevada is in the Basin and Range Province)

NORTHWEST REGION

(BFA) Pueblo Valley
(BFB) Continental Lake Valley
(BFC) Gridley Lake Valley
(BFD) Virgin Valley
(BFE) Sage Hen Valley
(BFF) Guano Valley
(BFG) Swan Lake Valley
(BFH) Massacre Lake Valley
(BFI) Long Valley
(BFJ) Macy Flat
(BFK) Coleman Valley
(BFL) Mosquito Valley
(BFM) Warner Valley
(BFN) Surprise Valley
(BFO) Boulder Valley
(BFP) Duck Lake Valley

BLACK ROCK DESERT REGION

(BGA) Pilgrim Flat
(BGB) Painter Flat
(BGC) Dry Valley
(BGD) Sano Valley
(BGE) Smoke Creek Desert
(BGF) San Emidio Desert
(BGG) Granite Basin
(BGH) Hualapai Flat
(BGI) High Rock Lake Valley
(BGJ) Mud Meadow
(BGK) Summit Lake Valley
(BGL) Black Rock Desert
(BGM) Pine Forest Valley
(BGN) King River Valley: Rio King Subarea
(BGO) Kings River Valley: Sod House Subarea
(BGP) Desert Valley
(BGQ) Silver State Valley
(BGR) Quinn River Valley: Orovada Subarea
(BGS) Quinn River Valley: McDermitt Subarea

SNAKE RIVER BASIN

(BHA) Little Owyhee River Area
(BHB) South Fork Owyhee River Area
(BHC) Independence Valley
(BHD) Owyhee River Area
(BHE) Bruneau River Area
(BHF) Jarbridge River Area
(BHG) Salmon Falls Creek Area
(BHH) Goose Creek Area

HUMBOLDT RIVER BASIN I

(BIA) Marys River Area
(BIB) Starr Valley Area
(BIC) North Fork Area
(BID) Lamoille Valley
(BIE) South Fork Area
(BIF) Huntington Valley
(BIG) Dixie Creek-Tenmile Creek Area
(BIH) Elko Segment
(BII) Susie Creek Area
(BIJ) Maggie Creek Area
(BIK) Marys Creek Area
(BIL) Pine Valley
(BIM) Crescent Valley
(BIN) Carico Lake Valley
(BIO) Upper Reese River Valley
(BIP) Antelope Valley
(BIQ) Middle Reese River Valley
(BIR) Lower Reese River Area
(BIS) Whirlwind Valley
(BIT) Boulder Flat
(BIU) Rock Creek Valley
(BIV) Willow Creek Valley
(BIW) Clovers Area

*31. GEOGRAPHIC UNIT (continued, Nevada)

HUMBOLDT RIVER AREA II

(BJA) Pumpernickel Valley
(BJB) Kelly Creek Area
(BJC) Little Humboldt Valley
(BJD) Hardscrabble Area
(BJE) Paradise Valley
(BJF) Winnemucca Segment
(BJG) Grass Valley
(BJH) Imlay Area
(BJI) Lovelock Valley
(BJJ) Lovelock Valley: Oreana Subarea
(BJK) White Plains

WEST CENTRAL REGION

(BKA) Bradys Hot Springs Area
(BKB) Fernley Area
(BKC) Fireball Valley
(BKD) Granite Springs Valley
(BKE) Kumiva Valley

TRUCKEE RIVER BASIN

(BLA) Winnemucca Lake Valley
(BLB) Pyramid Lake Valley
(BLC) Dodge Flat
(BLD) Tracy Segment
(BLE) Warm Springs Valley
(BLF) Spanish Springs Valley
(BLG) Sun Valley
(BLH) Truckee Meadows
(BLI) Pleasant Valley
(BLJ) Washoe Valley
(BLK) Lake Tahoe Basin
(BLL) Truckee Canyon Segment

WESTERN REGION

(BMA) Lemmon Valley: Western Part
(BMB) Lemmon Valley: Eastern Part
(BMC) Antelope Valley
(BMD) Bedell Flat
(BME) Dry Valley
(BMF) Newcomb Lake Valley
(BMG) Honey Lake Valley
(BMH) Skedaddle Creek Valley
(BMI) Red Rock Valley
(BMJ) Cold Spring Valley
(BMK) Long Valley

CARSON RIVER BASIN

(BNA) Carson Desert
(BNB) Carson Desert: Packard Valle
(BNC) Churchill Valley
(BND) Dayton Valley
(BNE) Eagle Valley
(BNF) Carson Valley
(BNG) Lahontan Valley

WALKER RIVER BASIN

(BOA) Antelope Valley
(BOB) Smith Valley
(BOC) Mason Valley
(BOD) East Walter Area
(BOE) Walker Lake Valley: Schurz Subarea
(BOF) Walker Lake Valley: Lake Subarea
(BOG) Walker Lake Valley: Whiskey Flat - Hawthorne Subarea

CENTRAL REGION I

(BPA) Alkali Valley (Mineral): Northern Part
(BPB) Alkali Valley (Mineral): Southern Part
(BPC) Mono Valley
(BPD) Huntoon Valley
(BPE) Teels Marsh Valley
(BPF) Adobe Valley
(BPG) Queen Valley
(BPM) Soda Spring Valley: Western Part
(BPN) Gabbs Valley
(BPO) Rawhide Flats
(BPP) Fairview Valley
(BPQ) Stingaree Valley
(BPR) Cowkick Valley
(BPS) Eastgate Valley Area
(BPT) Dixie Valley

*31. GEOGRAPHIC UNIT (continued, Nevada)

(BPH) Fish Lake Valley
(BPI) Colombus Salt Marsh Valley
(BPJ) Rhodes Salt Marsh Valley
(BPK) Garfield Flat
(BPL) Soda Spring Valley: Eastern Part
(BPU) Buena Vista Valley
(BPV) Pleasant Valley
(BPW) Buffalo Valley
(BPX) Jersey Valley
(BPY) Edwards Creek Valley
(BP1) Bodie-Aurora Uplands

CENTRAL REGION II

(BQA) Smith Creek
(BQB Lone Valley
(BQC) Monte Cristo Valley
(BQD) Big Smoky Valley: Tonopah Flat
(BQE) Big Smoky Valley: Northern Part
(BQF) Grass Valley
(BQG) Kobeh Valley
(BQH) Monitor Valley: Northern Part
(BQI) Monitor Valley: Southern Part
(BQJ) Ralston Valley
(BQK) Alkali Spring Valley (Esmeralda)
(BQL) Clayton Valley
(BQM) Lida Valley
(BQN) Stonewall Flat
(BQO) Sarcobatus Flat
(BQP) Gold Flat
(BQQ) Cactus Flat
(BQR) Stone Cabin Valley
(BQS) Little Fish Lake Valley
(BQT) Antelope Valley (Eureka & Nye)
(BQU) Stevens Basin
(BQV) Diamond Valley
(BQW) Newark Valley
(BQX) Little Smoky Valley: Northern Part
(BQY) Little Smoky Valley: Central Part

CENTRAL REGION III

(BRA) Little Smoky Valley: Southern Part
(BRB) Hot Creek
(BRC) Kawich Valley
(BRD) Emigrant Valley: Groom Lake Valley
(BRE) Emigrant Valley: Papoose Lake Valley
(BRF) Yucca Flat
(BRG) Frenchman Flat
(BRH) Indian Springs Valley
(BRI) Pahrump Valley
(BRJ) Mesquite Valley (Sandy Valley)
(BRK) Ivanpah Valley: Southern Part
(BRL) Ivanpah Valley: Northern Part
(BRM) Jean Lake Valley
(BRN) Hidden Valley (South)
(BRO) Eldorado Valley
(BRP) Three Lakes Valley (Northern Part)
(BRQ) Tikapoo Valley: Northern Part
(BRR) Tikapoo Valley: Southern Part
(BRS) Penoyer Valley (Sand Spring)
(BRT) Coal Valley
(BRU) Garden Valley
(BRV) Railroad Valley: Southern Part
(BRW) Railroad Valley: Northern Part

*31. GEOGRAPHIC UNIT (continued, Nevada)

CENTRAL REGION IV

(BSA) Jakes Valley
(BSB) Long Valley
(BSC) Ruby Valley
(BSD) Clover Valley
(BSE) Butte Valley: Northern Part
(BSF) Butte Valley: Southern Part
(BSG) Steptoe Valley
(BSH) Cave Valley
(BSI) Dry Lake Valley
(BSJ) Delamar Valley
(BSK) Lake Valley
(BSL) Spring Valley
(BSM) Tippett Valley
(BSN) Antelope Valley (White Pine & Elko) Southern Part
(BSO) Antelope Valley (White Pine & Elko) Northern Part
(BSP) Goshute Valley
(BSQ) Independence Valley (Pequop Valley)

GREAT SALT LAKE BASIN

(BTA) Thousand Springs Valley: Herrill Siding - Brush Creek Area
(BTB) Thousand Spring Valley: Toano-Rock Spring Area
(BTC) Thousand Spring Valley: Rocky Butte Area
(BTD) Thousand Spring Valley: Montello-Crittenden Creek Area
(BTE) Grouse Creek Valley
(BTF) Pilot Creek Valley
(BTG) Great Salt Lake Desert
(BTH) Deep Creek Valley
(BTI) Pleasant Valley
(BTJ) Snake Valley
(BTK) Hamlin Valley

ESCALANTE DESERT

(BUA) Escalante Desert

COLORADO RIVER BASIN

(BVA) Dry Valley
(BVB) Rose Valley
(BVC) Eagle Valley
(BVD) Spring Valley
(BVE) Paterson Valley
(BVF) Panaca Valley
(BVG) Clover Valley
(BVH) Lower Meadow Valley Wash
(BVI) Kane Springs Valley
(BVJ) White River Valley
(BVK) Pahroc Valley
(BVL) Pahranagat Valley
(BVM) Coyote Spring Valley
(BVN) Three Lakes Valley (Southern Part)
(BVO) Las Vegas Valley
(BVP) Colorado Valley
(BVQ) Piute Valley
(BVR) Black Mountains Area
(BVS) Garnet Valley
(BVT) Hidden Valley (North)
(BVU) California Wash
(BVV) Muddy River Springs Area (Upper Moapa Valley)
(BVW) Lower Moapa Valley

COLORADO RIVER BASIN II

(BWA) Tule Desert
(BWB) Virgin River Valley
(BWC) Gold Butte Area
(BWD) Greasewood Basin

*31. GEOGRAPHIC UNIT (continued, Nevada)

DEATH VALLEY BASIN

(BXA) Mercury Valley
(BXB) Rock Valley
(BXC) Fortymile Canyon: Jackass Flats
(BXD) Fortymile Canyon: Buckboard Mesa
(BXE) Oasis Valley
(BXF) Crater Flat
(BXG) Amargosa Desert
(BXH) Grapevine Canyon
(BXI) Oriental Wash

*31. GEOGRAPHIC UNIT: For the codes in Idaho, refer to the map contained in Section 435.

Geographic Unit Codes for Idaho:

MIDDLE ROCKY MOUNTAINS

(RØA) Bear Lake Plateau
(RØB) Bear Lake Valley
(RØC) Eastern Wasatch Range
(RØD) Western Wasatch Range
(RØE) Soda Springs Valley
(RØF) Western Aspen Range
(RØG) Schmid/Webster Range
(RØH) Willow Creek/Grays Lake
(RØI) Northern Blackfoot Mts.
(RØJ) Caribou Range
(RØK) Upper Snake River/ Swan Valley
(RØL) Snake River Range
(RØM) Big Hole Mts.
(RØN) Upper Teton/Falls River
(RØO) Island Park

BASIN AND RANGE

(B1A) Cache Valley
(B1B) Eastern Malad Range
(B1C) So. Portneuf/Cottonwood Cr.
(B1D) Southwest Portneuf Mts.
(B1E) Southeast Portneuf Mts.
(B1F) Gem Valley
(B1G) Portneuf Valley
(B1H) Northeast Portneuf Mts.
(B1I) Northwest Portneuf Mts.
(B1J) Chesterfield
(B1K) Blackfoot River Valley
(B1L) Putnam Peak/Yandell Mts.
(B1M) Northeast Bannock Mts
(B1N) Northwest Bannock Mts.
(B1O) Southwest Bannock Mts.
(B1P) Western Malad Range
(B1Q) Malad Valley
(B1R) Eastern Blue Spring Hills
(B1S) Western Blue Spring Hills
(B1T) Pocatello Valley
(B1U) Curlew Valley
(B1V) Arbon Valley
(B1W) Eastern Deep Creek Mts.
(B1X) Southeast Deep Creek Mts.
(B1Y) Western Deep Creek Mts.
(B2A) Rockland Valley
(B2B) Eastern Sublette Mts.
(B2C) Western Sublette Mts.
(B2D) Southwest Sublette Mts.
(B2E) Curlew Grasslands
(B2F) Eastern Black Pine Peak
(B2G) Western Black Pine Peak
(B2H) Raft River Valley
(B2I) Eastern Albion Hills
(B2J) Western Albion Hills
(B2K) Junction Creek
(B2L) Lower Portneuf/Marsh

NORTHERN ROCKY MOUNTAINS

(N3A) Medicine Lodge Mountains
(N3B) Southern Beaverhead Mts.
(N3C) Beaverhead Mountains
(N3D) Birch Creek Valley
(N3E) Lemhi Valley
(N3F) Southeast Lemhi Range
(N3G) Southwest Lemhi Range
(N3H) Northeast Lemhi Range
(N3I) Northwest Lemhi Range
(N3J) Little Lost River Valley
(N3K) Pahsimeroi
(N3L) Southeast Lost River Range
(N3M) Southwest Lost River Range
(N3N) Northeast Lost River Range (Eastern Pahsimeroi)
(N3O) Northwest Lost River Range (Western Pahsimeroi)
(N3P) Big Lost River Valley
(N3Q) Challis/Round Valley
(N3R) White Knob Mountains
(N3S) East Fork Salmon River
(N3T) Eastern Lone Pine Peak
(N3U) Challis Mountains
(N3V) Iron Creek/Baldy Mt.
(N3W) Panther Creek
(N3X) Shoup/Ulysses
(N3Y) Middle Fork Salmon Drainage

*31. GEOGRAPHIC UNIT (continued, Idaho)

NORTHERN ROCKY MOUNTAINS (continued)

(N4A) Disappointment/ Cottonwood Creek
(N4B) Chamberlain Basin
(N4C) Arctic Point/ Northern Sheepeater Mt.
(N4D) Warrens
(N4E) Slate Creek
(N4F) French Creek
(N4G) Hazard Creek/Goose Creek
(N4H) New Meadows
(N4I) Eastern Brundage Mts.
(N4J) Long Valley/North Fork
(N4K) Western North Fork Range
(N4L) South Fork Salmon/Johnson Cr.
(N4M) Middle Fork Payette
(N4N) South Fork Payette
(N4O) Eastern Sawtooth Mts.
(N4P) Sawtooth Valley
(N4Q) Basin Butte/Lookout Mt.
(N4R) Yankee Fork/Warm Springs Cr.
(N4S) Boise River
(N4T) Boise Basin
(N4U) Western Boise Ridge
(N4V) Boise Front
(N4W) Wood River Mountain
(N4X) Little Wood River

COLUMBIA-SNAKE RIVER PLATEAU

Eastern Snake River Plain Section

(S5A) Upper Snake River Plain
(S5B) Lower Teton River
(S5C) Pioneer Basin
(S5D) Eastern Snake Plain
(S5E) Idaho Falls/ Aberdeen Irrigation Tract
(S5F) Twin Falls/Burley
(S5G) Gooding/Jerome/Rupert
(S5H) Wood River/Silver River
(S5I) Snake River Canyon (Deep Creek - Salmon Falls)

Malheur-Boise-King Hill Section (Western Snake River Plain)

(S6A) Salmon Falls Creek
(S6B) Rosevear/Deadman/ Sailor Creek
(S6C) Bennett Hills
(S6D) Camas Prairie
(S6E) Bruneau River
(S6F) Lower Jacks Creek
(S6G) Lower Rabbit/Sinker/ Castle Creek Plain
(S6H) Snake River Canyon (Guffy Butte-Deep Creek)
(S6I) Mountain Home Desert
(S6J) Lower Valley
(S6K) Weiser Cove

Owyhee Uplands

(S7A) Upper Goose Creek
(S7B) Northwest Cassia Hills
(S7C) Southwest Cassia Hills
(S7D) Upper Salmon Falls Creek/ Shoshone Creek
(S7E) Jarbidge Uplands
(S7F) Owyhee Plateau
(S7G) Southern South Mountain
(S7H) Northern South Mountain
(S7I) Cow Creek/Jordon Creek
(S7J) Upper Jacks Creek
(S7K) Owyhee Mountains

*31. GEOGRAPHIC UNIT (continued, Idaho - Utah)

Seven Devils Section

(S8A) Garden Valley-Montour
(S8B) Southwest-West Mts.
(S8C) East-West Mountains
(S8D) Eastern Squaw Butte
(S8E) Southwest Squaw Butte
(S8F) Northwest Squaw Butte
(S8G) Paddock Hills
(S8H) Crane Creek Hills
(S8I) Upper Weiser Drainage
(S8J) Northwestern West Mts.
(S8K) Sage Creek/Pine Creek/ Hornet Creek Mountains
(S8L) Monroe - Man Creeks
(S8M) Brownlee
(S8N) Oxbow
(S8O) Seven Devils
(S8P) Rapid River-Boulder Creek
(S8Q) Lower Salmon (Whitebird - Riggins)
(S8R) Whitebird Creek

Tri-State Uplands

(S9A) Lower Salmon
(S9B) Joseph - Doumecq Plains
(S9C) Wolf Creek/Getta Creek

*31. GEOGRAPHIC UNITS: For the codes in Utah, refer to the map contained in section 435.

Geographic Unit Codes for Utah:

COLORADO PLATEAU

(CAA) Uinta Basin
(CAB) Book Cliffs-Roan Plateau
(CAC) Mancos Shale Lowlands
(CAD) Uncompahgre Extension
(CAE) Salt Anticline
(CAF) LaSal Mountains
(CAG) Hatch Syncline
(CAH) Great Sage Plain
(CAI) Abajo (Blue) Mountains
(CAJ) Blanding Basin
(CAK) Monument Upwarp
(CAL) Slick Rock
(CAM) Kaiporowits Plateau-Escalante Benches
(CAN) Grand Staircase
(CAP) Circle Cliffs-Teasdale Anticlines
(CAQ) Henry Mountains
(CAR) San Rafael Swell
(CAS) Green River Desert
(CAT) Inner Canyons
(CAO) St. George Basin
(CAU) Lisbon Prong Salt Ant.

MIDDLE ROCKY MOUNTAINS

(RBA) Wasatch Range
(RBB) Wasatch Hinterland
(RBC) Clarkston Mountain
(RBD) Cache Valley
(RBE) Bear River Plateau-Bear Lake
(RBF) Bear River
(RBG) Crawford Mountains
(RBH) Uinta Mountains
(RBI) High Uintas Subsection
(RBJ) Eastern Uintas Subsec.
(RBK) Marginal Benches Subsec.

BASIN AND RANGE - COLORADO PLATEAU TRANSITION

(TDA) Wasatch Plateau
(TDB) Sanpete-Sevier Valleys
(TDC) Gunnison Plateau-Valley
(TDD) Pavant Range-Canyon Range
(TDE) Tushar Volcanic
(TDF) Lava-Capped Subsection
(TDG) Limestone-capped Subsection
(TDH) Tonoquints Volcanic
(TDI) Escalante Desert Subsection
(TDJ) Southern High Plateau

BASIN AND RANGE

(BEA) Great Salt Lake
(BEB) Lakeside
(BEC) Wasatch Front Valleys
(BED) Uinta Extension
(BEE) Thomas Mountains-Tintic Mountains
(BEF) Sevier Desert-Black Rock Desert
(BEG) Confusion Basin
(BEH) Beaver Dam Range
(BEI) Deep Creek Mountains
(BEJ) Great Salt Lake Desert
(BEK) Grouse Creek-Raft River
(BEL) Curlew Valley
(BEM) Hansel Mountains-West Hills

*31. GEOGRAPHIC UNITS: For the codes in Wyoming, refer to the map contained in Section 435.

Geographic Unit Codes for Wyoming:

MIDDLE ROCKY MOUNTAINS

(RBL) Fossil Basin
(RBM) Jackson Hole
(RBN) Big Horn Basin
(RBO) Wind River Mountains
(RBP) Overthrust Belt
(RBQ) Gros Ventre Mountains
(RBR) Teton Mountains
(RBS) Yellowstone Plateau
(RBT) Absaroka Range
(RBU) Beartooth Mountains
(RBV) Big Horn Mountains
(RBW) Owl Creek Mountains
(RBX) Bridger Mountains

SOUTHERN ROCKY MOUNTAINS

(RAA) Medicene Bow Mountains
(RAB) Sierra Madre Mountains
(RAC) Laramie Range

WYOMING BASIN

(WCA) Green River Basin
(WCB) Kindt Basin
(WCC) Red Desert/Great Divide Basin
(WCD) Washakie Basin
(WCE) Wind River Basin
(WCF) Shirley Mountains
(WCG) Seminoe Mountains
(WCH) Bridger Basin
(WCI) Hanna Basin
(WCJ) Sweetwater Arch
(WCK) Rawlin's Uplift
(WCL) Rock Springs Uplift
(WCM) Gas Hills
(WCN) Green Mountains
(WCO) Rattlesnake Range
(WCP) Hoback Basin

GREAT PLAINS

(GAA) Black Hills
(GAB) Powder River Basin
(GAC) Hartville Uplift
(GAD) Denver Basin
(GAE) Laramie Basin
(GAF) Shirley Basin

*32. TOPOGRAPHIC LOCATION: There are two levels of encoding for site location, (a) its position on the dominant landform and (b) its immediate setting. (It may be most convenient to start with the smaller landform.) Determine the site's location on both the primary landform (major topography) and secondary landform (minor topography). Refer to section 405 for illustrated landform examples, and sections 410-425 for definitions.

Primary Landform	Secondary Landform
☐	☐

Primary
Landform

(A) Mountain Spine
(B) Hil
(C) Tableland/Mesa
(D) Ridge
(E) Valley
(F) Plain
(G) Canyon
(H) Island
(Z) Unknown

Secondary
Landform

(A) Alluvial Fan
(B) Alcove/Rock Shelter
(C) Arroyo
(D) Basin
(E) Cave
(F) Cliff
(G) Delta
(H) Detached Monolith
(I) Dune
(J) Floodplain
(K) Ledge
(L) Mesa/Butte
(M) Playa
(N) Portable Geologic Feature
(O) Plain
(P) Ridge/Knoll
(Q) Slope
(R) Terrace/Bench
(S) Talus Slope
(T) Island
(U) Outcrop
(V) Spring Mound/Bog
(W) Valley
(X) Cutbank
(Y) Riser
(1) Multiple Secondary Landforms
(2) Bar
(3) Lagoon
(4) Ephemeral Wash
(5) Kipuka
(6) Saddle/Pass
(7) Graben
(8) Ballena
(Z) Unknown

*33. ON-SITE DEPOSITIONAL CONTEXT: Encode the type of deposition responsible for the formation of the immediate site area. Refer to section 430 for definitions. Use the text block on the site form to describe the general soil type.

Codes:

(A) Fan
(B) Talus
(C) Dune
(D) Stream Terrace
(E) Playa
(F) Shore Feature, extinct lake
(G) Shore Feature, existing lake
(H) Alluvial Plain (canyon, valley fill)
(I) Colluvium
(J) Moraine
(K) Flood Plain
(L) Marsh
(M) Landslide/Slump
(N) Delta
(P) Desert Pavement
(Q) Outcrop
(R) Stream Bed
(S) Aeolian
(T) None (i.e., rock art, no soil)
(U) Residual
(V) Bedrock
(Z) Unknown

*34. VEGETATION:

Life-Zone - Check the appropriate box. See section 455 for Life-Zone definition.

Community - Indicate the dominant vegetation on and around the site by placing the habitat code (see list below) in the site form boxes for the following entries:

1) Most common (primary) on-site vegetation.

2) Second most common (secondary) on-site vegetation.

3) Dominant vegetation surrounding the site.

See Section 460 for Community definitions.

Life-Zone Codes:

(A) Arctic-Alpine
(B) Hudsonian
(C) Canadian
(D) Transitional
(E) Upper Sonoran
(F) Lower Sonoran
(Z) Unknown

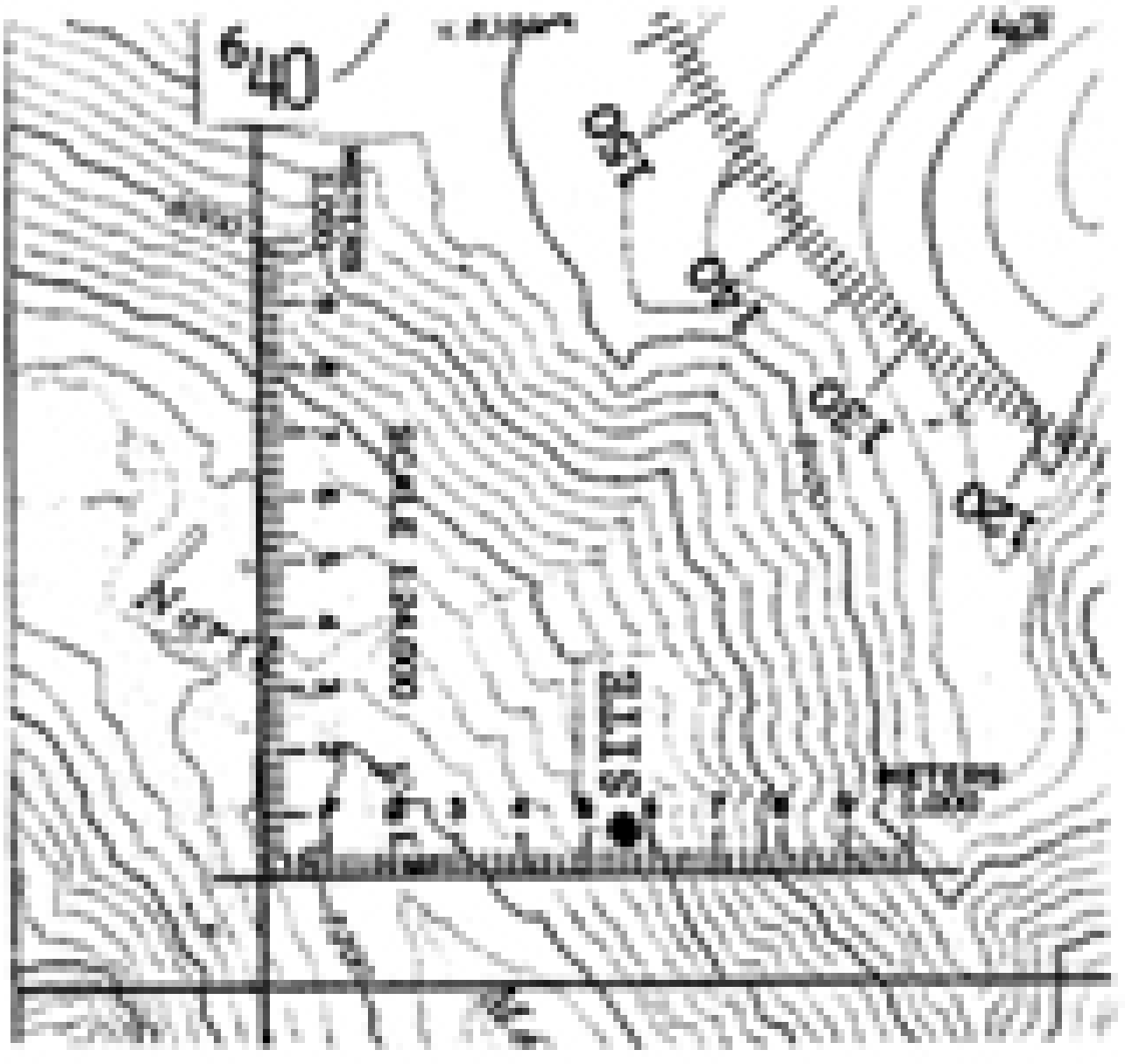
On-Site Community Codes:

(A) Aspen
(B) Spruce/Fir
(C) Douglas Fir
(D) Alpine tundra
(E) Ponderosa/Jeffery Pine
(F) Lodgepole Pine
(G) Other Forest or Mixed Conifer Forest
(H) Pinyon-Juniper
(I) Wet Meadow
(J) Dry Meadow Agricultural/Developed/Seedings
(K) Oak-Maple Shrubland
(L) Riparian
(M) Grassland (bunch grasses)
(O) Shadscale (Salt Desert Shrub)
(P) Big Sagebrush
(Q) Little Sagebrush (Low Sagebrush)
(R) Barren
(S) Marsh/Swamp
(T) Lake/Reservoir
(U)
(V) Blackbrush
(W) Mountain Brush
(X) Prairie (short grasses)
(Y) Creosote Brush (Warm Desert Shrub)
(Z) Unknown
(1) Joshua Forest
(2) Juniper-Sage

*35. MISCELLANEOUS TEXT: This space is provided for a 25 character comment which will be included in the computer data file. Please use this space for information that cannot be otherwise encoded; for example, popular site name, C14 dates, etc. Include comments regarding future management recommendations such as stabilize site, nominate for National Register, avoid impact, etc.

36. COMMENTS/CONTINUATIONS/LOCATION OF CURATED MATERIALS/RECORDS: This space should be used for inclusion of any comments or continuations and the location of records and curated materials.

BE SURE TO ENCLOSE A LIST OF ANY ATTACHMENTS INCLUDED WITH THE SITE FORM.



The UTM calculator shows that this point is 560 meters east of the line, or UTM 640560m E.

330- PART C, HISTORIC SITE DATA

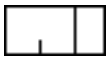
1. SITE TYPE: Enter the type of site; e.g., cabin, mine.

*2. HISTORIC THEMES: Space is provided for encoding up to two themes.

Theme Codes:

(AR)	Architecture
(BA)	Banks
(BR)	Breweries and Saloons
(CC)	Civilian Conservation Corps/WPA (or Conservation in general)
(CI)	Commerce/Industry
(CM)	Communication
(CD)	Community Development
(CO)	Conservation/Natural Resources
(CA)	Cultural/Literature/Arts/Journalism
(CL)	Cultural Landscape
(DM)	Divorce/Marriage
(DR)	Dude Ranches
(ED)	Education
(EN)	Engineering
(EF)	Entertainment
(ET)	Ethnicity
(EX)	Exploration (pre-1850)
(FA)	Federal Administrative Site
(FR)	Farming/Ranching (Agriculture)
(FO)	Foundries
(FU)	Funerary
(GO)	Big Game Outfitters
(GA)	Gaming
(HE)	Health
(LG)	Logging/Timber
(MI)	Military/Indian Conflict
(MN)	Mining/Mineral Extraction
(MT)	Military-general
(NA)	Native American
(NT)	Nuclear Testing
(PK)	Parks
(PL)	Planning/Development
(PD)	Political Development/Government
(PO)	Post Office
(PR)	Prostitution
(RC)	Recreation/Tourism
(RE)	Religion
(RR)	Railroad
(RT)	Transportation (including Roads/Trails)
(SC)	Scientific
(SI)	Service Industry
(SO)	Social Organizations & Movements/Relief Programs
(TR)	Trapping/Fur Trade
(WM)	Women's Movement
(WW)	Waterworks (dams, ditches)/Reclamation
(ZZ)	Unknown (or leave blank)

*3. CULTURAL AFFILIATION AND DATING METHOD: Record the cultural affiliation of the site, if known, and how that was determined. A total of two cultures/dating methods may be entered. Enter the earliest first.



Cultural Afiliation Dating Method

Cultural Affiliation Codes:

(AF)	Afro-American
(BA)	Basque
(CH)	Chinese/Oriental
(EA)	European/American
(ME)	Mexican
+ (ZZ)	Unknown (or leave blank)

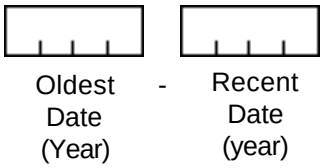
+ Note: This code may be used to indicate an historic site, when encoding old site forms containing minimal information.

Dating Method Codes:

(A)	None (or leave blank)
(F)	Cross-Dating/Diag. Artifacts
(H)	Informant
(I)	Historical Record
(G)	Other
(L)	Title Search
(Z)	Unknown

Record historical Native-American sites here, using affiliation codes from the Prehistoric Section.

*4. OLDEST AND MOST RECENT DATE: Enter the earliest known date of occupation as well as the most recent known date of occupation.



*5. SITE DIMENSIONS: Record the dimensions of the site in meters and calculate the area. If the site is approximately an oval shape, the area can be easily estimated by multiplying one-half the length by one-half the width by 3.1416.

Special Area Codes: (99999) Unknown
(99998) More than 100,000 sq. meters

*6. SURFACE COLLECTION/METHOD: Indicate if the surface artifacts were collected and the method used. If a collection was made, please indicate what was collected and where it is curated in part A-36.

Collection Codes:
(A) None (or leave blank)
(B) Grab Sample (partial, arbitrary, and/or intuitive)
(C) Designed Sample (specify exact type)
(D) Complete Collection
(Z) Unknown

*7. ESTIMATED DEPTH OF CULTURAL FILL: Indicate your estimate of the maximum depth of cultural deposits and how determined.

Codes:
(A) Surface (no buried deposits)
(B) 0-20 cm (0-8 inches)
(C) 20-100 cm (8-39 inches)
(D) More than 100 cm (greater than 1 meter/39 inches)
(E) Fill noted but exact depth unknown

*8. EXCAVATION STATUS: Show if the site has been tested or excavated.

Codes:
(A) Excavated
(B) Tested
(C) Unexcavated (or leave blank)

If the site has been tested, indicate the testing method and the location of the test on site sketch.

*9. SUMMARY OF ARTIFACTS AND OBJECTS: Identify the general types of artifacts and objects observed. For additional information see Historic Artifact Appendix.

Artifact Type

CODES:

Transportation/Vehicles

(AC)	Aircraft/Aircraft Parts	(SW)	Sheep Camp Wagon
(CR)	Cars/Car Parts	(TA)	Tractor/Tractor Parts
(RC)	Railroad Car/Part	(TK)	Truck/Truck Parts
(RR)	Railroad Rails, Ties, Spikes	(WA)	Wagon/Wagon Parts

Farm Implements/Equipment

(BB)	Buckets/Barrels	(FT)	Farm Tools
(FM)	Farm Machinery		

Furniture

(FU)	Furniture	(SP)	Stove Parts/Stove
(FH)	Furniture Hardware (See Hardware)		

Equipment/Tools

(DE)	Drilling Equipment	(MT)	Mining Tools
(DL)	Drag Line	(OC)	Ore Car
(GT)	General Tools	(LM)	Sawmill/Logging Machinery
(LT)	Logging Tools	(SS)	Steam Shovel
(MN)	Mining/Milling Machinery	(WP)	Water Pump
(MS)	Mining Stone		

Weapons

(AM)	Ammunition	(FI)	Fire Arms
(AW)	Ammunition with Manufacturers marks		

Apparel

(AS)	Animal Shoes	(BW)	Buttons with Manufacturer's Marks
(BU)	Buttons/Fasteners without Manufacturer's Marks	(CL)	Clothing Items
		(SO)	Shoes

Hardware

(AP)	Asphalt	(NH)	Nails - Hand forged
(WF)	Barbed Wire	(NW)	Nails - Wire
(BH)	Building Hardware	(PH)	Plumbing Hardware
(BL)	Bolts/Nuts	(RV)	Rivet
(BR)	Brick	(SC)	Screws
(CO)	Concrete	(SH)	Shingles
(CM)	Corrugated Metal	(SA)	Slate
(EL)	Electrical Hardware	(SP)	Stove Parts
(FH)	Furniture	(ST)	Staples
(IN)	Insulators	(TP)	Tar Paper
(FL)	Linoleum	(WI)	Wire
(NC)	Nails - Cut		

Personal Items

(CD)	Coins - Domestic	(PI)	Miscellaneous Personal	(SO)	Shoes
(CF)	Coins - Foreign	(OP)	Opium Pipes/Containers	(TE)	Toys, Games, Misc

Domestic

(BP)	Baking Powder Tins	(TW)	Cutlery/Silverware	(KU)	Kitchen Utensils
(CA)	Coal	(DI)	Domestic Items		

Containers

(BC)	Bottle Cap	(MD)	Metal Drum	(TC)	Tin Cans - Sanitary
(CN)	Can Lid	(MO)	Metal Tubes (Ointment,	(TO)	Tobacco Tins
(CE)	Coffee Can		Cream, Paste)	(TZ)	Tin Can Undetermined
(CU)	Cans - Utility	(MC)	Modified Tin Can	(TH)	Tin Cans - Hole in Cap
(JL)	Jar Lids	(MA)	Meat Can	(WC)	Wood Crate
(KC)	Key-opened tin cans	(TD)	Tin Cans - Hole in Top		

Euro-American Ceramic Vessels: see section 473.8 for illustrations.

(VL)	Ale bottle	(VI)	Crockery	(VG)	Platter
(VF)	Bowl	(VJ)	Mixing bowl	(VD)	Saucer
(VK)	Chamber pot	(VH)	Pitcher	(VA)	Tea cup
(VC)	Coffee cup/mug	(VE)	Plate		

Asian Ceramic Vessels: see section 473.8 for illustrations.

(VS)	Ginger jar	(VO)	Rice bowl	(VN)	Tea pot
(VX)	Globular storage jar	(VV)	Shouldered food jar	(VP)	Wine cup
(VY)	Opium pipe bowl	(VT)	Soy Sauce container	(VU)	Wine/tiger whiskey bottle
(VZ)	Other Asian	(VQ)	Spoon		
(VW)	Pan	(VM)	Tea cup		

FOR GLASS ARTIFACT FUNCTION CODES, SEE SECTION 330 page 8

Other

(BA)	Battery	(IA)	Isolated Artifact	(SM)	Scientific/Medical
(CT)	Clock Parts	(LN)	Lamp Parts	(WG)	Worked Glass
(CP)	Cuples/Crucibles	(NI)	No Information		

General (Item cannot be specifically determined)

(BO)	Bone	(GL)	Glass	(RB)	Rubber
(CS)	Ceramics	(LE)	Leather	(SY)	Synthetics/Plastic
(CK)	Crockery	(ME)	Metal	(WD)	Wood
(FA)	Fabric	(PA)	Paper		

10. HISTORIC CERAMICS

Paste Attributes: (Paste color/paste texture) Choose one, for definitions see 473.4.

Gray/coarse
Gray/fine
Other (describe)
Red-brown/coarse
Red-brown/fine
Unknown
White/extremely fine (translucent)
White/fine
Yellow (dark cream or buff)/cream
Yellow (dark cream or buff)/fine

Glazes and Slips: Choose one, see 473.5 for definitions.

Albany slip
Bennington, Rockingham or other flint enamel glaze
Celadon glaze
Chinese brown glaze (Jian you)
Clear glaze
Colored glaze (describe)
Other (describe)
Salt glaze
Unglazed (or leave blank)
Unknown
White opaque glaze (Majolica, delft tin enamel glaze)

10. HISTORIC CERAMICS - continued

Decorative Techniques: Choose one, see 473.6 for definitions.

Decal
Gilding
Handpainted
Molded-Relief
None
Other (describe)
Spatter or Sponge
Sprigging or Other Applied Relief
Transfer Print
Unknown

Pattern names: Choose one, see 473.7 for definitions.

Other (describe)
None (or leave blank)

Euro-American:
Annular or Banded
Boote's Octagon
Corn and Oats
Davenport's Decagon
Featheredge/Shelledge
Fig
Flow Blue
Gaudy Dutch/Welch
Gothic
Hyacinth
Landscape Scene
Lily of the Valley
Mocha or Moss
Paris
Syndeham Shape
Willow

Asian
Bamboo, Swatow, Three Circles and Dragonfly
Canton, Nanking
Double Happiness, Swirl
Four Seasons, Four Flowers
Rose Medallion

VESSEL FORMS:
Unidentified

10. HISTORIC CERAMICS - continued

Euro-American Forms: see section 473.8 for illustrations.
- Ale bottle
- Bowl
- Coffee cup/mug
- Chamber pot
- Crockery
- Mixing bowl
- Pitcher
- Plate
- Platter
- Saucer
- Tea cup

Asian Forms: see section 473.8 for illustrations.
- Ginger jar
- Globular storage jar
- Opium pipe bowl
- Other Asian
- Pan
- Rice bowl
- Shouldered food jar
- Soy Sauce container
- Spoon
- Tea cup
- Tea pot
- Wine cup
- Wine/tiger whiskey bottle

11. GLASS: For each glass entry, information on quantity, manufacture, color, function, trademark and decoration is required. Indicate the estimated sherd/fragment count in the Quantity entry. See appendix 472 for information on glass.

Function Codes
(A) None Present (or leave blank)
(Z) Undetermined function

Manufacture
Automatic Machine
Free Blown
Not Applicable
Semi-automatic
Undetermined or leave blank

Color
Amber
Aqua
Black (Olive Green)
Blue/Cobalt
BrownRed/Ruby
Clear (Arsenic)/Modern Clear
Green Yellow
Light Amber/Honey-Colored or Pink (Selenium)
Milk/Opal
Not Applicable
Other
Purple/Amethyst (Manganese)
Undetermined

Function
None Present (or leave blank)
Undetermined function

BEVERAGE BOTTLES
(GB) Alcoholic - Whiskey
(GD) Alcoholic - Champagne
(GE) Alcoholic - Beer
(GF) Alcoholic - Ale/Stout
(HF) Beverage Bottle (Wine)
(GJ) Other Alcoholic
(GI) Other Non-Alcoholic Bottle
(GG) Soda/Mineral Water
(G8) Undetermined Beverage Bottle

HOUSEHOLD
(GA) Catsup
(HB) Condiment (unknown type)
(GO) Fruit/Canning Jars
(GP) Milk Bottles
(GS) Mustard
(GU) Other Kitchen
(GQ) Preserves/Pickles
(GR) Peppersauce/Clubsauce

DOMESTIC
(HC) Ashtray
(HE) Goblet
(GV) Ink
(GC) Other Domestic Bottle
(GX) Tooth Powder
(GW) Shoe Polish
(HD) Wine Glass

SPECIALTY BOTTLES
(GY)Figural

MEDICAL/CHEMICAL
(GM) Cosmetic
(GN) Other Medical/Chemical
(GH) Patent/Proprietary Medicine
(GK) Pharmaceutical/Drug Store
(G0) Poison

OTHER GLASS
(G2) Chemical Related
(G7) Insulators
(G3) Lamp Chimney
(G4) Other
(G6) Tableware
(G5) Unknown Function
(G1) Window

Trademarks:
Not Present
Present
Unidentified

Decorative Techniques:
Embossed
None Painted
Plain
All Others
Unknown

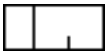
12. MAXIMUM DENSITY: Record the estimated density of glass vessels and/or ceramic vessels within one square meter. From this figure, estimate the maximum number of vessels represented at the site.

13. TIN CANS: see descriptions in 471.1-4.

Functional categories:

Coffee	Tea
Food	Tobacco
Fruit	Syrup
Juice	Unknown
Non-food	Vegetable
Other	

*14. LANDSCAPE AND CONSTRUCTED FEATURES: Indicate the number and kinds of features. It might be argued that some features are actually architecture and should be listed in that category. If a rock alignment or a depression is clearly a structure, then it should be recorded under "Architectural Features" item C-15.



- Feature

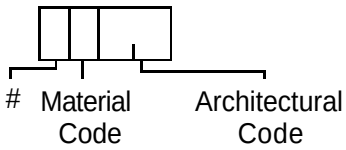
Quantity Codes:

(Ø)	None (or leave blank)
(1-8)	One through eight
(9)	Nine or more
(Z)	Unknown

Feature Codes:

(AG)	Agriculture Field
(AP)	Arrastra/Mexican Patio
(AN)	Aspen Art
(BG)	Battleground
(AI)	Cairn
(CB)	Cemetery/Burial
(CP)	Charcoal Platform
(DE)	Depression
(DH)	Drill Hole
(DU)	Dump
(HD)	Hand Dug Well
(HE)	Hearth/Campfire
(IN)	Inscriptions
(LA)	Landing Strip
(ML)	Mill Tailings
(MN)	Mine
(MT)	Mine Tailings (ore dump)
(NI)	No Information (or leave blank)
(OT)	Other
(PH)	Prospect Hole
(PT)	Placer Tailings
(QU)	Quarry
(RA)	Rock Alignment
(RC)	Rock Concentration
(RG)	Railroad Grade/Bed
(SS)	Smelter Slag
(TR)	Trail/Road
(TW)	Tramway
(WT)	Water Trough

15. BUILDINGS AND STRUCTURES: Enter up to 6 architectural features.



Quantity Codes:

(Ø)	None (or leave blank)
(1-8)	One through eight
(9)	Nine or more
(Z)	Unknown

Material Codes:

(E)	Adobe
(J)	Brick
(W)	Combination of materials
(F)	Concrete
(I)	Earthen/Subterranean
(K)	Frame
(P)	Log
(A)	None
(R)	Other
(L)	Steel
(B)	Stone
(Z)	Unknown
(C)	Wood (cut lumber)

Architecture Codes:

(BV)	Aerial Tram
(DH)	Animal Shelter
(CI)	Bake Oven
(AV)	Barn
(BS)	Bridge
(DI)	Bunk House
(CQ)	Cabin-Box Corner
(CH)	Cabin-False Notch
(CE)	Cabin-Full Dovetail Notch
(CF)	Cabin-Half Dovetail Notch
(CW)	Cabin-General
(CM)	Cabin-Mixed Notching
(CC)	Cabin-Saddle Notch
(CG)	Cabin-Square Notch
(CO)	Cabin-Unknown or other notching
(CD)	Cabin-V or Steeple Notch
(AI)	Cairn
(DJ)	Carport
(DK)	Carriage House
(CN)	Chicken Coop
(CV)	Chimney
(BC)	Cistern
(DL)	Commercial Building
(AJ)	Corral
(BJ)	Cribbing
(BQ)	Dam, Non-earthen
(CA)	Docks
(AK)	Dugout
(BF)	Fence
(BM)	Flour Mill
(BP)	Flume
(BY)	Foundations
(CB)	Fortifications
(DM)	Garage
(AD)	Granary
(BD)	Hay Derrick
(BH)	Head Frame
(BR)	Headgate
(CR)	Hogan
(AW)	Ice House
(DN)	Industrial Building
(AL)	Kiln
(BE)	Loading Chute
(CU)	Lodge (vertical pole)
(CX)	Lookout Tower
(BO)	Mill Race
(AN)	Mine Shaft/Adit
(BI)	Mine Surface Plant
(DO)	Mining Building
(AM)	Monument

*15. BUILDINGS AND STRUCTURES: (continued)

(AS) Multiroom Structure +
(AA) None (or leave blank)
(DB) Ore Bin
(BL) Ore Mill
(AO) Other
(CP) Outhouse
(AY) Oven
(BW) Pipeline
(CK) Power Plant
(DP) Public Building
(DQ) Pump House
(BU) Railroad Tracks
(DR) Religious Building
(DC) Refinery
(DS) Residence
(CT) Root Cellar
(BN) Sawmill
(DT) School
(AX) Sheds
(DU) Silo
(AR) Single-room Structure
(BK) Smelter
(DV) Spring House
(DG) Stock Tank
(DX) Summer Kitchen
(CS) Sweathouse
(DA) Tent Platform
(BT) Trestle
(ZZ) Unknown (or leave blank)
(BX) Utility Pole
(BG) Wall
(BB) Water Tower
(CL) Water Trough
(AU) Well
(CJ) Windlass
(BA) Windmill

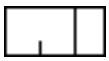
(+ = No other information)

16. HISTORIC COMMENTS/CONTINUATIONS: Indicate which numbered item is being continued. Show artifact sketches here or on an attached sheet. Indicate whether historic archives and records have been searched (for example: county records, general land office, historical society, land management agency records, and oral history/interviews).

320 - PART B, PREHISTORIC SITE DATA

1. SITE TYPE: Enter the type of site; e.g., flake scatter, cave, etc.

*2. CULTURAL AFFILIATION AND DATING METHOD: Record the cultural affiliation of the site, If known, and how that was determined. A total of two cultures/dating methods may be entered. Enter the earliest first.



Cultural Afiliation Dating Method

Cultural Affiliation Codes:

- (PP) Pre-Paleoindian
- (PA) Paleoindian
- (AR) Archaic (general)
  - (EA) Early Archaic
  - (MA) Middle Archaic
  - (LA) Late Archaic
  - (LP) Late Prehistoric (general)
  - (FR) Fremont
  - (AN) Anasazi/Pueblo (general)
  - (BM) Basketmaker (general)
    - (B1) Basketmaker I
    - (B2) Basketmaker I-II
    - (B3) Basketmaker II (Z)
    - (B4) Basketmaker II-III
    - (B5) Basketmaker III
    - (BP) Basketmaker III - Pueblo I
    - (PU) Pueblo (general)
    - (P1) Pueblo I
    - (P2) Pueblo I-II
    - (P3) Pueblo II
    - (P4) Pueblo II-III
    - (P5) Pueblo III
    - (P6) Pueblo III-IV
    - (P7) Pueblo IV
    - (P8) Pueblo IV-V
    - (P9) Pueblo V
- (PC) Protohistoric/Contact (general)
  - (NM) Numic (general)
    - (UP) Ute/Paiute
    - (SH) Shoshoni
    - (HP) Hopi
  - (WA) Washoe
  - (AL) Algonquian (general)
    - (CY) Cheyenne
    - (AP) Arapaho
  - (NP) Nez Perce
  - (NA) Navajo
  - (SO) Sioux (general)
    - (DA) Dakota
    - (LK) Lakota
    - (CR) Crow

Dating Method Codes:

- (A) None (or leave blank)
- (B) Carbon-14
- (C) Tree Ring
- (D) Archaeomagnetic
- (E) Fluorine
- (F) Cross-Dating (general)
- (G) Other
- (J) Obsidian Hydration
- (K) Thermoluminescence
- (L) Architectural Style
- (M) Ceramic Cross Dating
- (N) Lithic Cross Dating
- Unknown

*2. CULTURAL AFFILIATION AND DATING METHOD - continued

(YU)	Yuman	
(PI)	Pima	
(WP)	Western Pluvial Lake Tradition	
(NI)	No Information	
(OT)	Other	+Note: This code may be used to
+ (ZZ)	Unknown Aboriginal	indicate a prehistoric site, when
(PE)	Paleoenvironmental	encoding old site forms containing
(PO)	Paleontological	minimal information.

*3. SITE DIMENSIONS: Record the dimensions of the site in meters and calculate the area. If the site is approximately an oval shape, the area can be easily estimated by multiplying one half the length by one-half the width times 3.1416.

Special Area Codes: (99999) Unknown
(99998) More than 100,000 sq. meters

*4. SURFACE COLLECTION/METHOD: Indicate if surface artifacts were collected and the method used. If a collection was made, please note what was collected and where it is curated in part A-36.

Collection Codes:
- (A) None (or leave blank)
- (B) Grab Sample (partial, arbitrary, and/or intuitive)
- (C) Designed Sample (specify exact type)
- (D) Complete Collection
- (Z) Unknown

*5. DEPTH OF CULTURAL FILL: Indicate your estimate of the maximum depth of cultural deposits and how determined.

Codes:
- (A) Surface (no buried deposits)
- (B) 0-20 cm (0-8 inches)
- (C) 20-100 cm (8-39 inches)
- (D) More than 100 cm (greater than one meter/39 inches)
- (E) Fill noted but exact depth unknown
- (F) Depth suspected, but not tested
- (Z) Unknown

*6. EXCAVATION STATUS: Show if the site has been tested or excavated. If the site has been tested, describe testing methods and indicate location of test on sketch map.

Codes:
- (A) Excavated
- (B) Tested
- (C) Unexcavated (or leave blank)

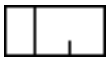
*7. SUMMARY OF ARTIFACTS AND DEBRIS: Identify the general types of artifacts and debris observed, up to 6 entries. Scatters/Concentrations are treated as separate entities.

Artifact Type

Artifact Codes:

(BG) Bedrock Mortar, Metate or combination
(BN) Bone Tools
(BS) Scattered Burned Stone/Firecracked Rock Scatter
(BT) Basketry/Textiles
(CA) Charcoal Scatter
(CB) Charcoal and/or Burned Bone Scatter/Concentration
(CC) Corn Cobs
(CS) Ceramic Scatter/Concentration
(FG) Figurine: non-ceramic
(GS) Ground/Pecked Stone Scatter
(HA) Horn/Antler Artifacts
(IA) Isolate Artifact
(IS) Incised Stone
(JA) Jacal Fragments
(LA) Lithic Sources: Chalcedony
(LB) Lithic Sources: Basalt
(LC) Lithic Sources: Chert
(LF) Lithic Sources: Fossilized Wood
(LG) Lithic Sources: General
(LI) Lithic Sources: Ignimbrite
(LO) Lithic Sources: Obsidian
(LP) Lithic Sources: Porcelanite
(LQ) Lithic Sources: Quartzite
(LU) Lithic Sources: Siltstone
(LY) Lithic Sources: Rhyolite
(LV) Lithic Sources: Non-Volcanic Glass
(LR) Leather/Fur/Hide Remains
(LS) Lithic Scatter/Concentration
(NB) Native-manufactured beads
(PP) Pipes (smoking)
(PN) Pendants
(RS) Rubble/Shaped Stone
(SL) Shell
(SV) Steatite Vessels
(TB) Trade Beads
(TU) Turquoise Source
(UC) Unfired Ceramic Objects
(VB) Vesicular Basalt Scatter
(VR) Vegetation/Organic Remains
(WD) Wood Artifacts
(WB) Bone Scatter
(OT) Other
(NI) No Information
(ZZ) Unknown Artifact

8. LITHIC TOOLS: Enter up to 6 kinds of stone tools. Refer to Section 470 for projectile point type illustrations for your area. Use the appropriate "Z" codes if you are not sure of the proper type name. Draw all projectile points in part B-15 of the site form and locate each one on the site sketch map.



- Lithic Type

Quantity Codes:

(Ø) None (or leave blank)
(1-8) One through eight
(9) Nine or more
(Z) Unknown

* Please note that the time periods delineated below are simply for organizational purposes only. They are not meant to be strict chronological categories . Projectile points that represent specific time periods in one area may be something completely different in another area.

Artifact Type Codes:

(AA) NONE PRESENT (or leave blank)

PALEOINDIAN

(BA) Folsom
(BB) Clovis
(BC) Scottsbluff/Eden
(BF) Hell Gap
(BG) Cody Knife
(BH) Great Basin Transverse (Crescent)
(BI) Black Rock Concave Base
(BJ)Haskett
(BK) Agate Basin
(BL) Alberta
(BM) Windust
(BN) Cascade
(BZ) Undetermined PaleoIndian
(BE) Other PaleoIndian
(BO) Colby
(BP) Anzick
(BQ) Midland Unfluted
(BR) Allen
(BS) Pryor Stemmed
(BT) Medicine Lodge (Lanceolate)
(BU) Medicine Lodge (Round Base)
(BV) Medicine Lodge (Split Base)
(BW) Scottsbluff II
(BX) Plainview

ARCHAIC

(CA) Elko Series (may also be Fremont)
(CB) Northern Side-notched
(CC) Pinto Series
(CD) Humboldt Concave Base
(CE) McKean Lanceolate
(CF) Sudden Side-notched
(CG) Hawken Side-notched
(CH) San Rafael Side-notched
(CI)Gt. Basin Stemmed (Lake Mojave, Parman, Cougar Mt.)
(CJ)Rocker Side-notched
(CK) Laddie Creek
(CM) Gypsum
(CN) Surprise Valley Split Stem
(CO) Steamboat
(CP) Duncan
(CQ) Hanna
(CR) Mallory
(CS) Tucannon
(CT) Besant
(CU) Pelican Lake
(CV) Pahaska Side-notched
(CW) Blackwater Side-notched
(CY) Lookingbill
(CX) Martis
(C1) Yonkee
(C3) Wedding of the Waters
(C4) Triangular Unnotched
(C5) Gatecliff
(CL) Other Archaic
(CZ) Undetermined Archaic

*8. LITHIC TOOLS - continued

LATE PREHISTORIC PERIOD
(DA) Bear River Side-notched
(DB) Uinta Side-notched
(DC) Rose Spring Series
(DD) Nawthis Side-notched
(DE) Parowan Basal-notched
(DF) Bull Creek Points
(DG) Eastgate Series (including Meadow Canyon)
(DH) Daphne Creek Side-notched
(DJ) Cottonwood
(DK) Avonlea
(DL) Birch Creek
(DM) Harder Series
(DN) Columbia Valley
(DO) Wallowa
(DP) Wapiti Corner-notched
(DQ) Prairie Side-notched
(DZ) Undetermined Late Period
(DI) Other Late Period
(DR) Kings Beach

PROTOHISTORIC/HISTORIC PERIOD
(EA) Ute/Piute Side-notched
(EC) Desert Side-notched
(ED) Plains Side-notched
(EE) Farson Tri-notched
(EZ) Undetermined Historic Period

ANASAZI
(HA) Side-notched
(HB) Corner-notched
(HC) Stemmed
(HD) Concave Base
(HE) Other Anasazi
(HF) More than 3 types
(HG) Bull Creek
(HZ) Undetermined Anasazi

NON-DIAGNOSTIC TOOLS
(IA) Utilized Flakes
(IB) Drill
(IC) Blade
(ID) Core
(IE) Chopper
(IF) Hammerston
(IG) Biface
(IH) Scraper
(II) Uniface, unknown function
(IJ) Misc. Abrading Implements
(IK) Graver
(IL) Burin

PROJECTILE POINT TYPE UNKNOWN
(ZA) Large* Side-notched
(ZB) Small Side-notched
(ZC) Large Corner-notched
(ZD) Small Corner-notched
(ZE) Large Stemmed
(ZF) Small Stemmed
(ZG) Large Triangular
(ZH) Small Triangular
(ZI) Large Lanceolate
(ZJ) Small Lanceolate
(ZK) Large Other Type
(ZL) Small Other Type
(ZM) General Serated
(ZN) Large Contracting Stem
(ZO) Small Contracting Stem
(ZP) Large Square Stem
(ZQ) Small Square Stem
(ZR) Unknown Concave Base
(ZZ) Unknown Unspecified Type

*8. LITHIC TOOLS - continued

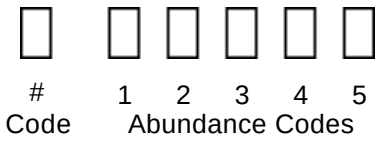
(IM) Knife
(IN) Grooved Stone/ Shaft Straightener
(IO) Pecking Stone
(IP) Polishing Stone
(IQ) Pounding Stone
(IR) Axe
(IS) Utilized Core
(IT) Maul
(IU) Flaked Cobble
(IY) Other

*"Large" refers to projectile points one inch in original length or greater. See Section 440 for illustrated examples.

GRINDING STONES - LOWER
(MA) Basin Milling Stone: Portable
(MB) Basin Milling Stone: Non-portable
(MC) Trough Metate: Portable
(MD) Trough Metate: Non-portable
(ME) Slab Milling Stone: Portable
(MF) Slab Milling Stone: Non-portable
(MG) Bedrock Mortar/Metate
(MI) Anvil
(MH) Hopper Mortar
(MZ) Unknown Grinding Stone
(MN) Unknown Ground Stone (not necessarily lower)

GRINDING STONES - UPPER
(NA) Mano (single-handed)
(NB) Mano (two-handed)
(NC) Pestal
(ND) Edge Ground Cobble
(NZ) Unknown handston

9. LITHIC DEBITAGE: Estimate the total quantity of waste flakes and the relative abundance of the following five types of debitage, based on flaking stages: 1) Primary Decortication, 2) Secondary Flake, 3) Tertiary Flake, 4) Shatter, and 5) Core. Refer to Section 445 for definitions of these five types.

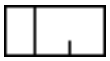


Total Quantity Codes:
(A) None Present (or leave blank)
(B) 1-9
(C) 10-25(2)
(D) 25-100
(E) 100-500
(F) 500 +
(Z) Unknown

Relative Abundance Codes:
(0) None Present (or leave blank)0%)
(1) Rare (under 10%)
Common (10-50%)
(3) Dominant (50%+)
(Z) Unknown

10. MAXIMUM DENSITY: Record the estimated maximum density of flakes within one square meter.

*11. CERAMIC ARTIFACTS: Enter the estimated quantity of each ceramic type, up to 6 types. Use the appropriate "Z" codes if you are not sure of the proper type name. For definitions of Fremont Ceramics, see Prehistoric Ceramics of the Fremont by Rex Madsen, Museum of Northern Arizona, Ceramic Series No. 6 (1977).



- Ceramic Type

Quantity Codes:
(A) None (or leave blank)
(B) 1-9
(C) 10-25
(D) 25-100
(E) 100-500
(F) 500 +
(Z) Unknown

Ceramic Type Codes:
(AA) NONE PRESENT (or leave blank)

FREMONT
(BA) Great Salt Lake Gray Ware
(BB) Uinta Gray Ware
(BC) Sevier Gray Ware
(BD) Ivie Creek Black/White
(BE) Emery Gray Ware
(BF) Snake Valley Gray Ware
(BI) Promontory Gray Ware
(BJ) Snake Valley Black-on-Gray
(BK) Snake Valley Corrugated
(BL) Parogonah Coiled
(BZ) Undetermined Fremont
(BH) Other Fremont

MESA VERDE AFFILIATION
(EA) Mesa Verde Gray Ware
(EB) Mesa Verde Red Ware
(EC) Mesa Verde Black-on-White Ware
(ED) Mesa Verde Corrugated
(EE) Chapin Gray
(EF) Moccasin Gray

(EG) Mancos Gray
(EH) Mummy Lake Gray
(EI) Abajo Red-on-Orang
(EJ) Abajo Polychrome
(EK) Bluff Black-on-Red
(EL) Deadmans Black-on-Red
(EM) Chapin Black-on-White
(EN) Piedra Black-on-White
(EO) Cortez Black-on-White
(EP) Mancos Black-on-White
(EQ) McElmo Black-on-White
(ER) Mesa Verde Black-on-White
(ES) Mesa Verde Corrugated
(ET) Mancos Corrugated
(EU) Mancos/McElmo B/W
(EV) McElmo/Mesa Verde B/W
(EW) Chapin gray, fugitive red
(EX) Dolores Corrugated
(EY) Mesa Verde grayware - plain body sherd
(E1) Mesa Verde grayware - corrugated body sherd
(EZ) Undetermined Mesa Verde

NUMIC AFFILIATION
(FA) Southern Piute Utility Ware
(FB) Shoshoni Ware (Inter-mountain Tradition)
(FZ) Undetermined Numic

UPPER REPUBLICAN TRADITION
(GA) Upper Republican Tradition

WOODLAND TRADITION
(HA) Woodland Tradition

*11. CERAMIC ARTIFACTS - Continued

TUSAYAN		VIRGIN		MOAPA		SHINARUMP	
(JA)	Lino Gray	(JP)	Mesquite Gray	(KG)	Moapa Brown		
(JB)	Kana-a Gray						
(JC)	Coconino Gray	(JQ)	North Creek Gray	(KH)	Boulder Gray	(KT)	Shinarump Gray
(JD)	Tusayan Corr.	(JR)	North Creek Corr	(KI)	Moapa Corr	(KU)	Shinarump Corr
(JE)	Moenkopi Gray	(JS)	Washington Corr	(KJ)	Clayhole Corr	(KV)	Buckskin Corr.
(JF)	Lino b/g	(JT)	Mesquite b/g	(KK)	Boulder b/g		
(JG)	Kana-a b/w	(JU)	Washington b/g	(KL)	Boysag b/g		
(JH)	Black Mesa b/w	(JV)	St. George b/g	(KM)	Trumball b/g	(KW)	Wahweap b/g
(JI)	Sosi b/w	(JW)	North Creek b/g	(KN)	Moapa b/g	(KX)	Wygaret b/g
(JJ)	Dogoszhi b/w	(JX)	Hildale b/g	(KO)	Slide Mtn. b/g	(LA)	Vermillion b/g
(JK)	Flagstaff b/w	(KA)	Glendale b/g	(KP)	Poverty Mtn. b/g	(LB)	Cottonwood b/g
	Shato b/w (Painted Corrugated)						
(JL)	Black Mesa	(KB)	Orderville b/g	(KQ)	Toroweap b/g	(LC)	Shanub b/g
(JM)	Sosi style	(KC)	Hurricane b/g	(KR)	Whitmore b/g	(LD)	Toquerville b/g
(JN)	Dogoszhi style	(KD)	Pipe Spring b/g	(KS)	Fern Glen b/g	(LE)	Mt. Carmel b/g
(JO)	Flagstaff style	(KE)	Parashant b/g	(KF)	Tuckup b/g	(LF)	Big Spring b/g

MISCELLANEOUS KAYENTA CODES

(MA)	Kayenta Affiliation Gray Ware	(CR)	Medicine Black on Red
(MB)	Kayenta Affiliation Red Ware	(CS)	Medicine Gray
(MC)	Kayenta Affiliation Corrugated Ware	(CT)	Middleton Black on Red
(MD)	Kiet Siel Gray (dates after Moenkopi Corrugated)	(CU)	Middleton Polychrome
		(CV)	Middleton Red
(ME)	Rainbow Gray (Middle-Late Pueblo III)	(CY)	North Creek Fugitive Red
(MF)	Kiet Siel Polychrome (Late Pueblo III)	(DB)	San Juan Red
(MG)	Kiet Siel Black-on-red (Late Pueblo III)	(DG)	Tsegi Orange
(MH)	Tsegi Black-on-orange (Late Pueblo III)	(DH)	Tsegi Red on Orang
		(DI)	Tsegi Polychrome
		(DK)	Tusayan Black on Red
(CB)	Cameron Polychrome	(DL)	Tusayan Black on White
(CC)	Citadel Polychrome	(DM)	Tusayan Polychrome
(CG)	Garfield Black on White	(LG)	Virgin Series Grayware - Plain
(CH)	Kanan-a Black on Gray	(LH)	Virgin Series Grayware Corrugated
(CL)	Kayenta Black on White	(LI)	Virgin Series Whiteware
(CM)	Kayenta Polychrome	(LZ)	Kayenta Unknown
(CO)	Lino Black on White		
(CP)	Lino Fugitive Red		

*11. CERAMIC ARTIFACTS - Continued

MANDAN TRADITION
(NA) Crow

LOWER COLORADO
(OA) Lower Colorado Buffware
(OB) Tizan Brownware

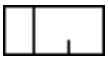
NAVAJO
(SA) Navajo Polychrome
(SB) Navajo Utility Ware

CERAMIC TYPES UNKNOWN
(OB) Brown
(ZA) Grayware
(ZB) Brownware
(ZC) Redware
(ZD) Corrugated
(ZE) Coiled
(ZF) Black-on-White
(ZG) Red-on-Orange
(ZH) Black-on-Red
(ZI) Polychrome
(ZJ) Black-on-Gray
(ZK) Undetermined Virgin Series Ceramics
(ZL) Red-on-Brown
(ZZ) Unknown Unspecified Ceramics (or other)

OTHER CERAMIC ARTIFACTS
(IA) Archaic Figurine
(IB) Fremont Figurine
(IC) Shoshoni Figurine
(ID) Basketmaker Figurine
(IE) Pueblo Figurine
(IF) Navajo Figurine
(IG) Ceramic Pipe
(IH) Spindle Whorl
(II) Imported/Exotic ceramic
(IY) Unknown Figurine
(IZ) Unknown Other Ceramic

12. MAXIMUM DENSITY (Ceramics): Enter the estimated maximum density of sherds within one square meter.

*13. NON-ARCHITECTURAL FEATURES: Indicate the number and kinds of features. It might be argued that some features are actually architecture and should be listed in that category. If a rock alignment or rubble mound is clearly a structure, then record it under item B-14 "Architectural Features".



- Feature

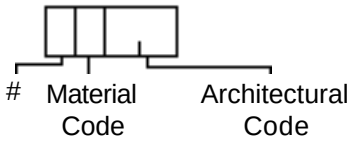
Quantity Codes:

(0)	None (or leave blank)
(1-8)	One through eight
(9)	Nine or more
(Z)	Unknown

Feature Codes:

(AT)	Agricultural Terrace
(BU)	Burial
(CD)	Corrals/Drivelines/Gametrap
(DE)	Depression
(CA)	Cache
(EF)	Effigy Figures/Intaglio
(ER)	Earthen Ring
(EM)	Earthen Mound
(FC)	Burned Stone/Firecracked Rock Concentration
(FW)	Fishing Weir
(HB)	Hunting Blind
(HE)	Hearth/Firepit
(MD)	Midden
(MW)	Medicine Wheel
(NI)	No Information
(OT)	Other
(PE)	Petroglyph (Pecked/Cut)
(PF)	Prepared Floor
(PI)	Pictograph (Painted)
(PR)	Prehistoric Road Segment
(QU)	Quarry
(RA)	Rock Alignment
(RB)	Roof Beam
(RC)	Rock Concentration
(RM)	Rubble Mound
(RP)	Roasting Pit
(SB)	Smoke Blackening
(SC)	Stone Circle
(SD)	Stone Circle with Depression
(SG)	Stained Soil - Generic
(SH)	Sharpening Grooves
(ST)	Step
(TN)	Tenaja
(TP)	Talus Pit
(WC)	Water Control (Irrigation)

*14. ARCHITECTURAL FEATURES: Enter up to 3 architectural features.



Quantity Codes:
(same as above)

Material Codes:
(A) None
(B) Masonry (Stone)
(C) Wood
(D) Jacal (Mud/Stick)
(E) Adobe
(F) Concrete
(G) Jacal/Masonry
(H) Jacal/Adobe
(I) Earthen/Subterranean
(Q) Brush
(R) Other
(T) Adobe/Masonry
(Z) Unknown

Architecture Codes:
(AA) None (or leave blank)
(AD) Granary
(AE) Cist
(AF) Pithouse
(AG) Kiva
(AH) Tower
(AI) Cairn
(AJ) Corral
(AL) Kiln
(AP) Single-room Structure
(AQ) Multiroom Structure
(AO) Other
(BG) Wall
(CR) Hogan
(CS) Sweathouse
(CU) Lodge (Vertical Pole)
(CV) War Lodge
(DD) Slab-lined Milling Bin
(DE) Wikiups/Ramadas
(DF) Storage Bin
(DY) Fence
(EA) Lean-to
(ZZ) Unknown

15. PREHISTORIC COMMENTS/CONTINUATIONS: Indicate which numbered item is being continued. Show artifact sketches here or on an attached sheet.

410 - PRIMARY LANDFORM:

1. CANYON - Any steep-walled feature cut by running water into bedrock, the sides of which are comprised of very steep slopes or cliffs rising from its bottom. Many canyons are named as such on U.S.G.S. Quad sheets, but the term can also apply to branches of these major canyons as well as gorges, ravines, or channels. Canyons are distinct from gullies which are cut into unconsolidated alluvium or colluvium. A canyon has slopes and cliffs in and on which there may be benches, fans, rimrock, colluvium and talus, landslides and slumps, caves and rockshelters.

2. HILL - A more or less isolated prominence with a peak or a crest, generally less then 1000 feet in elevation relief and limited in area. Often near a valley floor, a ridge system will be dissected into a series of hills.

3. MESA - A hill or small mountain with a flat top bounded on at least one side by a steep cliff.

4. MOUNTAIN SPINE - Mountains are the largest elevated landforms in the landscape, are of great areal extent with peaks and crests and are named as ranges and mountains on U.S.G.S. Quad sheets. Mountains are over 1000 feet in elevation and have been created by volcanic depositions and/or uplift. Used here, the mountain includes the buttes which are small, isolated mountains with steep sides, sometimes part of a larger range and sometimes not. Buttes do not have flat tops (see MESA).

5. PLAIN - A region of generally uniform slope, comparatively level or lightly hilly (0-3 degrees), of considerable extent and not broken by marked elevations and depressions. It may be an extensive valley floor or plateau summit (i.e. greater than 30 km.)

6. RIDGE - An elevated, relatively narrow landform with steep sides, which is a feature of a mountain, tableland, mesa, or hills. The bottom portion of the ridge along its sides is its foot, while the toe is at its distal end.

7. TABLELAND - A mountain sized landform with a flat or gently undulating top, bounded on one side by a cliff.

8. VALLEY - Low-lying land surrounded by mountains, either transversed by a stream or river or containing a lake or playa which receives the drainage of the surrounding highlands. Also used in the vernacular for intermontane and intramontane basins.

420 - SECONDARY LANDFORM:

1. ALLUVIAL FAN - A cone or fan shaped deposit of alluvium made by a stream where it changes gradient. Fans are usually formed where steams leave mountains and discharge into canyons and valleys. A fan has edges along its lateral margins, and a toe along its lower margin.

2. ALCOVE (Rockshelter) - A space within or below a natural overhang or a relatively shallow cavity in rock, all of which receives direct or indirect sunlight. An alcove differs from a cave in that the width of the mouth at the opening is larger than the depth of the cavity.

3. ARROYO (Gully) - A term used to describe the cut resulting from the erosional activity of an intermittent drainage in unconsolidated alluvium or colluvium (see CUTBANK). The walls of the erosion channel are usually steep.

4. BASIN - A depressed area into which the adjacent land drains, and having no surface outlet.

5. BOG - A wet, peaty deposit of limited extent, usually fed by a spring or seep. Bogs contain marshy vegetation and quake when disturbed. If a bog is in a spring mound, record it as a spring mound. (see SPRING MOUND)

6. CAVE - A natural cavity in the bedrock, deep enough so that at least part of it is in total darkness all year long.

7. CLIFF - A high, steep face of rock; a precipice. Cliffs form, in part, the sides of mesas, tablelands, and canyons, and can also occur on mountains, ridges, and hills.

8. CUTBANK - The steep face of a gully or riser of a wave-cut lake terrace which has recently been or is being eroded into alluvial or colluvial deposits. The term can also apply to road cuts. If a site is visible in a cut of any kind, the term "cutbank" has precedence over any other depositional situation.

9. DELTA - An alluvial deposit at the mouth of a river or stream where it discharges into a lake. Deltaic deposits of extinct lakes can often be recognized as such.

10. DETACHED MONOLITH - A physically detached stone slab or boulder that is located some distance downslope from its parent material.

11. DUNE - Drifted sand, or more rarely, silt or clay, transported and deposited by the action of wind (aeolian deposition). Dunes take many forms which are dependent on dependent on grain size, wind velocity, surface topography, etc., but generally appears as mounds, ridges, or small hills.

Sometimes windblown sand is deposited, not as a convex feature, but as a sheet or blanket which, when covering a relatively small area, can be distinguished from the surrounding soil because of its lighter color. Silt and clay dunes are formed when silty playa deposits dry out and become cracked and crumbly. The sand-sized crumbs are then transported by the wind to the playa margin and form a dune where subsequent precipitation melts the silt and clay crumbs into a solid mass. Dune sand is very well-sorted so that the grains tend to fall into a very narrow size range. Most dunes are found on valley floors but they can also be found on mountain slopes (the usual location of sand blankets) and crests. Dunes commonly occur flanking lake shores, along the edges of alluvial plains and terraces above river floodplains, and windward of river deltas, or other large sources of sand.

12. FLOODPLAIN - That portion of a river valley or stream course adjacent to the active channel which is composed of sediments deposited during the present regimen of the stream and which is covered with water during ordinary floods; in a stepped terrace system, this is usually the first terrace step above the stream bed.

13. ISLAND - An area of dry land completely surrounded by water or marsh. Also applies to an area within a playa which is only surrounded by water on an infrequent basis under the present climatic regime.

14. LEDGE - A narrow flat surface or shelf, usually of rock, that projects from a cliff face.

15. MESA/BUTTE - see entries in PRIMARY LANDFORM.

16. OUTCROP - A portion of a geological stratum which appears above the surface of its ground. An outcrop differs from a portable geological feature in that the portable feature has been detached from its parent stratum.

17. PATTERNED GROUND - Usually rings or polygons of stones, sometimes forming nets, surrounding a central area of finer grained materials; can also include fields of small mounds of similar size. The mounds are formed through frost heaving, as are some of the stone polygons. However, polygons can also be formed over volcanic bedrock which has cracked into large polygons as it cooled after eruption.

18. PLAYA - A dry lake or pond, usually very flat, composed of clays and silts with a high salt content, which crack polygonally when dry. Playas are usually the beds of extinct lakes which have had slightly higher stands; they presently are periodically inundated with shallow water which soon evaporates. Playas are usually devoid of vegetation because of the high salt content of the silt and because water does not

retain on them long enough to support marsh or lakeside vegetation. However, when the salt content is low enough, certain kinds of annual plants may grow on the playa soon after it dries out. Playas can be found on high mountain spines and ridges, on mesas and tablelands and any place that is poorly drained, and has relatively low precipitation or receives little runoff.

19. PORTABLE GEOLOGIC FEATURE - Stone slab or boulder that has been physically moved from its original position by human activity (e.g., pictographs or petroglyphs in modern masonry).

20. PLAIN - A region of generally uniform slope, comparatively level or slightly hilly (0-3 degrees), of considerable extent, and not broken by marked elevations and depressions. It may be an extensive valley floor or plateau summit (i.e., greater than 30 km).

21. RIDGE/KNOLL - see Ridge in PRIMARY LANDFORM..

22. RISER - The vertical element of a step-like landform such as a terrace or bench.

23. SLOPE - Any ground whose surface forms an angle with the horizontal plane whose incline is greater than 3 degrees.

24. SPRING MOUND - An elevated feature at or around a spring, composed of accumulated vegetation (peat) and aeolian materials (silt, sand) trapped in the vegetation; at hot springs, part or all of the mound may be composed of minerals precipitated from the water. A spring mound may contain a bog, but not vice-versa. See MARSH.

25. TERRACE/BENCH - Usually a linear feature; a relatively level area of soil or rock on a ridge, canyon side or otherwise sloping surface. Benches are distinct from terraces formed by the deposition and erosion of alluvial and colluvial material, and are most often features of the stratification of the bedrock, although they can also be formed by slides, slumps, and faults.

26. TALUS SLOPE - Talus is formed of colluvium or material being moved down slope mainly by gravity. However, talus is often fairly well sorted into cobble or boulder-sized particles which form long thin strips which run up and down the slope, or sheets, or poles beneath the cliffs and very steep slopes. Usually there is no vegetation on talus, although Ephedra or Mormon Tea likes to grow along the edges of the talus patches. Pits thought to be hunting blinds are often found in talus.

27. VALLEY - see Valley under PRIMARY LANDFORM.

28. BAR - 1. A mass of sand, gravel, or alluvium deposited on the bed of a stream, sea, or lake, or at the mouth of a stream forming an obstruction to water navigation. 2. A term used in a generic sense to include various types of submerged or emergent embankments of sand and gravel built on the sea floor by waves and currents. 3. An offshore ridge or mound of sand, gravel, or other unconsolidated material submerged at least at high tide, especially at the mouth of a river or estuary, or lying a short distance from and usually parallel to, the beach.

29. LAGOON - A metaphorical term for the ponding area behind a Pleistocene offshore or barrier bar (beaches) that collects fine textured sediments."

30. SADDLE/PASS - A low point on a ridge or spine, often the divide between the heads of streams. Saddles are not necessarily passes. A gap, defile or relatively low break in a mountain range through which a trail or road can pass .

31. KIPUKA - A grassy area surrounded by a lava flow.

32. GRABEN - A narrow block of topography that has dropped down between two faults.

33. BALLENA - A lineally dissected alluvial fan.

430 - ON SITE DEPOSITIONAL CONTEXT

This is an entry designed to convey information regarding the depositional processes involved in the creation of the immediate landform surrounding the site.

1. AEOLIAN - Wind-transported materials, including wind-blown sands, wind-blown silts and wind-carried volcanic ash.

2. ALLUVIAL PLAIN - The gently sloping or flat surfaced fill of wider canyons and valleys beyond the toes of alluvial fans coming in from side drainages, and above stepped terrace systems and/or the actual flood plain. In valleys, alluvial plains may have been originally formed as lake beds and are here distinct from extant lakes or playas; they may also be underlain by pediments. When valleys contain rivers or large streams, alluvial plains are often the step or top of the highest terrace and may represent the oldest surface. In canyons, alluvial plains are formed when successive terrace-forming episodes have filled the canyon bottom with alluvial deposits to the same elevation, rather than having formed a series of terrace steps and risers of varying elevations. Although alluvial plains created by streams often contain gravels, Holocene deposits (post-ice age) are usually finer-grained silty and sandy materials. Alluvium - Fine grained, well sorted deposition transported and deposited by running water.

3. CLIFF - See Secondary Landform Definitions (420).

4. COLLUVIUM - Rock and soil which is moving down, or has been deposited at the foot of steep slopes and cliffs, transported mainly by gravity, rather than water transport. The steep slopes of mountains are usually mantled with colluvium, often resting at the angle of repose. Individual particles move when lubricated with water and/or when tipped by the expansion and contraction of the soil during freeze-thaw and wetting and drying cycles. Colluvium is relatively loose, incoherent and poorly sorted (particles are of many different sizes). Talus is a distinct form of colluvium defined elsewhere.

5. DELTA - See Secondary Landform Definitions (420).

6. DUNE - See Secondary Landform Definitions (420).

7. FAN - See Secondary Landform Definitions (420).

8. FLOODPLAIN - See Secondary Landform Definitions (420).

9. LANDSLIDE - A mass of rock and/or soil which has fallen or slid downslope. The edges of a landslide are along its lateral margins; the toe of the slide is its distal end (see SLUMP).

10. MARSH - A shallow lake or pond, or a shallow portion of a larger lake which is filled with sedges, tules, rushes, and other marshy vegetation. Marshes contain standing water most all of the year.

11. MORAINE - The detritus deposited by a glacier at its terminus and along its lateral edges. Like colluvium, moraines are composed of unsorted and poorly consolidated material. Moraines from mountain glaciers are usually linear features, but can also form a generally lumpy terrain of relatively large areal extent.

12. OUTCROP - See Secondary Landform Definitions (420).

13. PLAYA - See Secondary Landform Definitions (420).

14. RESIDUAL - Soil material formed in place, presumably from the same rock on which it lies.

15. SHORE FEATURE: EXTANT LAKE - A beach, bar, spit, or wave-cut terrace which is being acted upon by water at present.

16. SHORE FEATURE: EXTINCT LAKE - A beach, bar, spit, or wave-cut terrace of a lake standing higher than presently exists.

17. SLUMP - The downward slipping of a mass of rock or soil moving a unit, usually with a backward motion.

18. STREAM BED - The bottom of the channel of a river or stream, wherein sediment is being actively moved downstream.

19. STREAM TERRACE - The relatively flat, horizontal, or gently sloping surface in a canyon or valley bottom made of alluvial materials deposited by a stream or river in times past. In some cases, successive depositional episodes have filled a valley or canyon with alluvial deposits to varying elevations, creating a series of terrace steps, the highest one of which the oldest and the lowest one of which is the youngest. Thus, the surface or step of a terrace is a depositional feature while the riser vertical component is erosional.

21. TALUS - See Secondary Landform Definitions (420).

The following maps are available in a separate section entitled MAPS.

435.1 UTAH GEOGRAPHIC UNITS 1

435.2 WYOMING GEOGRAPHIC UNITS 1

435.3 IDAHO GEOGRAPHIC UNITS 1

435.3 IDAHO GEOGRAPHIC UNITS 2

435.3 IDAHO GEOGRAPHIC UNITS 3

435.3 IDAHO GEOGRAPHIC UNITS 4

435.3 IDAHO GEOGRAPHIC UNITS 5

435.3 IDAHO GEOGRAPHIC UNITS 6

435.3 IDAHO GEOGRAPHIC UNITS 7

435.3 IDAHO GEOGRAPHIC UNITS 8

435.3 IDAHO GEOGRAPHIC UNITS 9

435.3 IDAHO GEOGRAPHIC UNITS 10

435.3 IDAHO GEOGRAPHIC UNITS 11

435.3 IDAHO GEOGRAPHIC UNITS 12

435.3 IDAHO GEOGRAPHIC UNITS 13

435.3 IDAHO GEOGRAPHIC UNITS 14

435.3 IDAHO GEOGRAPHIC UNITS 15

435.4 NEVADA GEOGRAPHIC UNITS 1

The following illustrations are available in the ILLUSTRATIONS section.

440.1 PROJECTILE POINT ILLUSTRATIONS

440.2 PROJECTILE POINT ILLUSTRATIONS

440.3 EXAMPLES OF UNKNOWN (MORPHOLOGICAL) TYPES
All examples shown are "Large" (greater than 1" in original length).

440.4 WYOMING PROJECTILE POINT ILLUSTRATIONS (after Frison 1978)*

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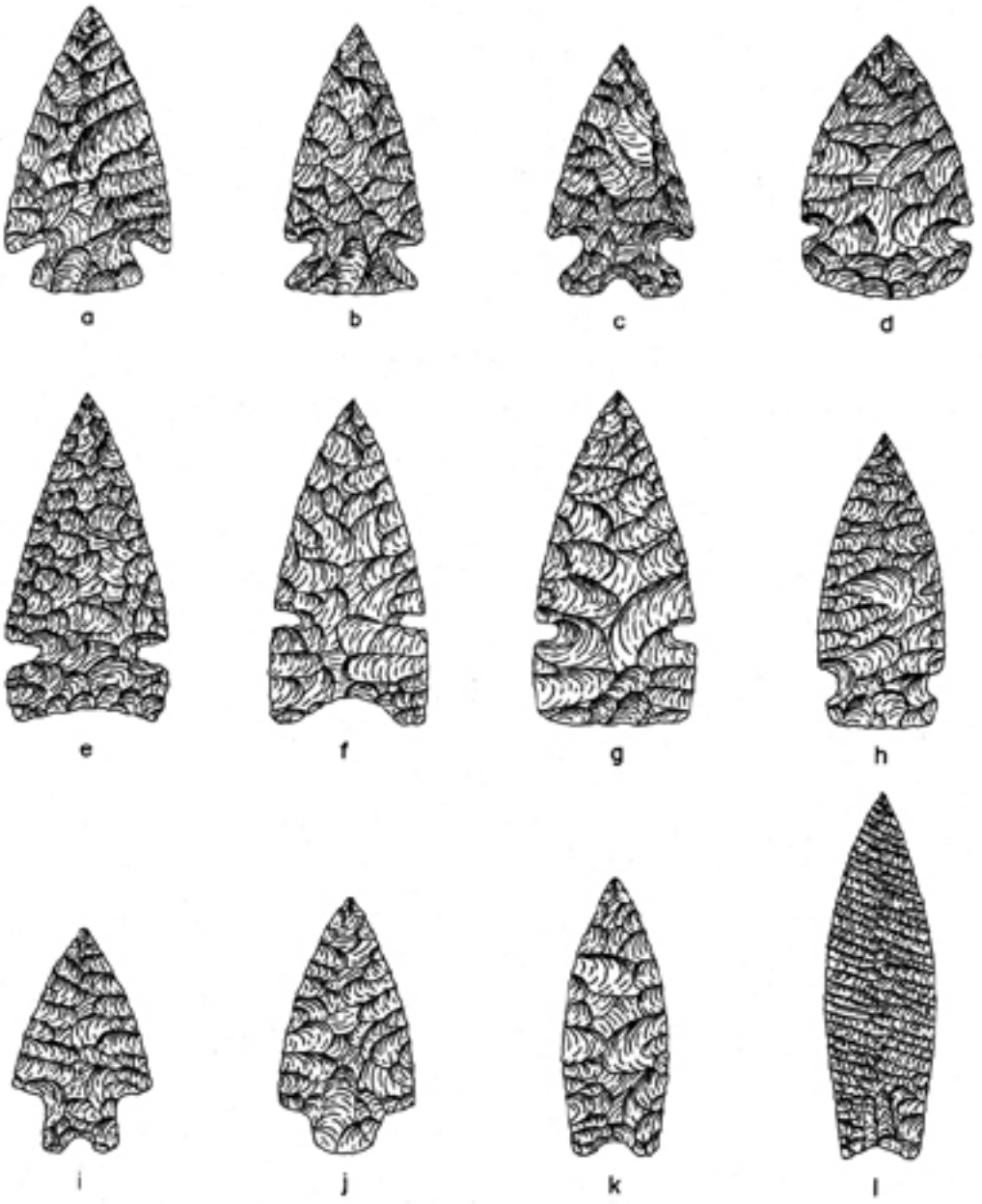
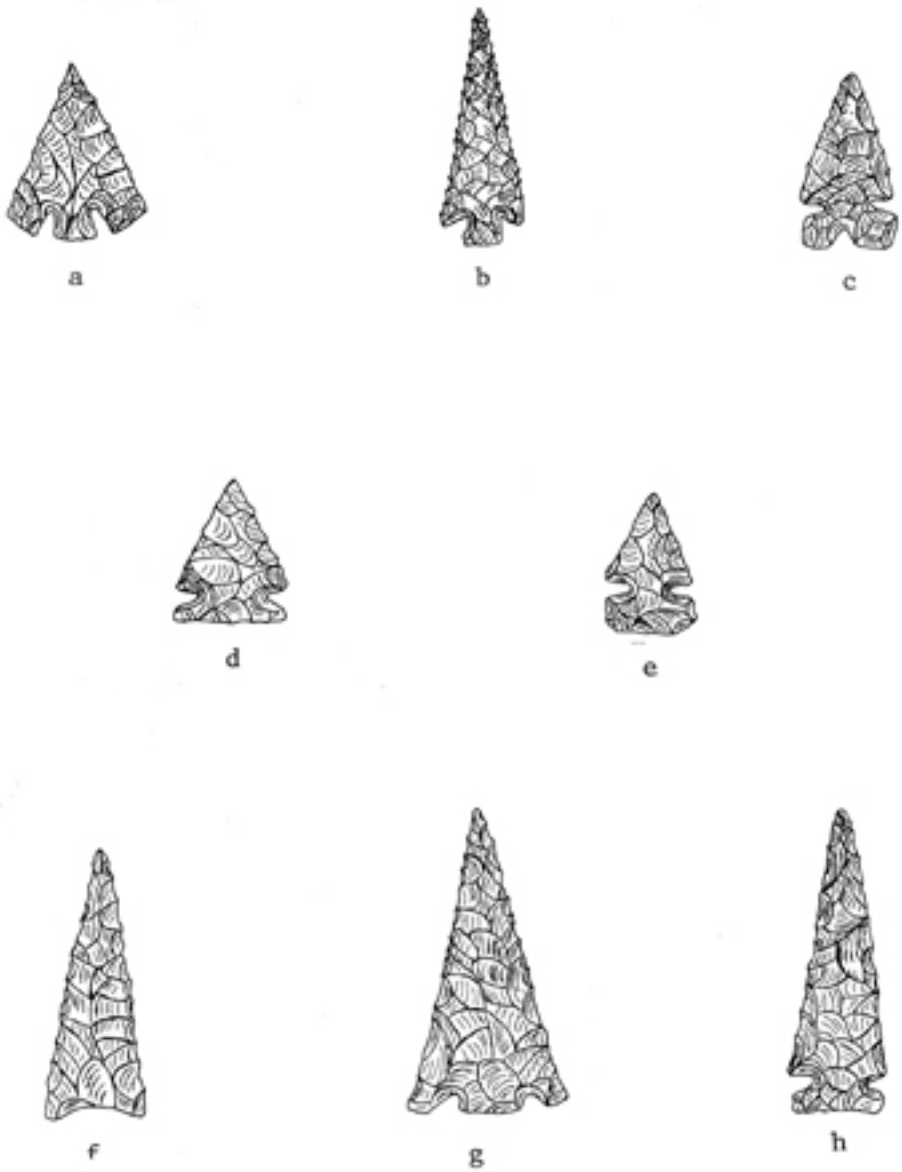
440.1 PROJECTILE POINT ILLUSTRATIONS



Mean shapes of projectile point types. a, Elko Corner-notched; b, Elko Side-notched; c, Elko Eared; d, Rocker Side-notched; e, Northern Side-notched; f, San Rafael Side-notched; g, Sudden Side-notched; h, Hawken Side-notched; i, Pinto Shouldered; j, Gypsum; k, McKean Lanceolate; l, Humboldt Concave-base A.

440.2 PROJECTILE POINT ILLUSTRATIONS

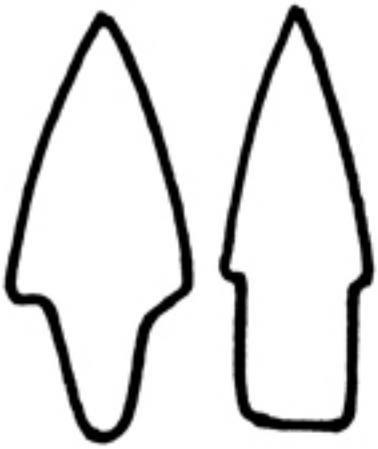


a, Eastgate Expanding Stem; b, Rose Spring Corner Notched; c, Desert Side Notched; d, Uinta Side Notched; e, Bear River Side Notched; f, Bull Creek; g, Parowan Basal Notched; h, Nawthis Side Notched.

440.3 EXAMPLES OF UNKNOWN (MORPHOLOGICAL) TYPES
All examples shown are "Large" (greater than 1" in original length).

Side Notched

Corner Notched



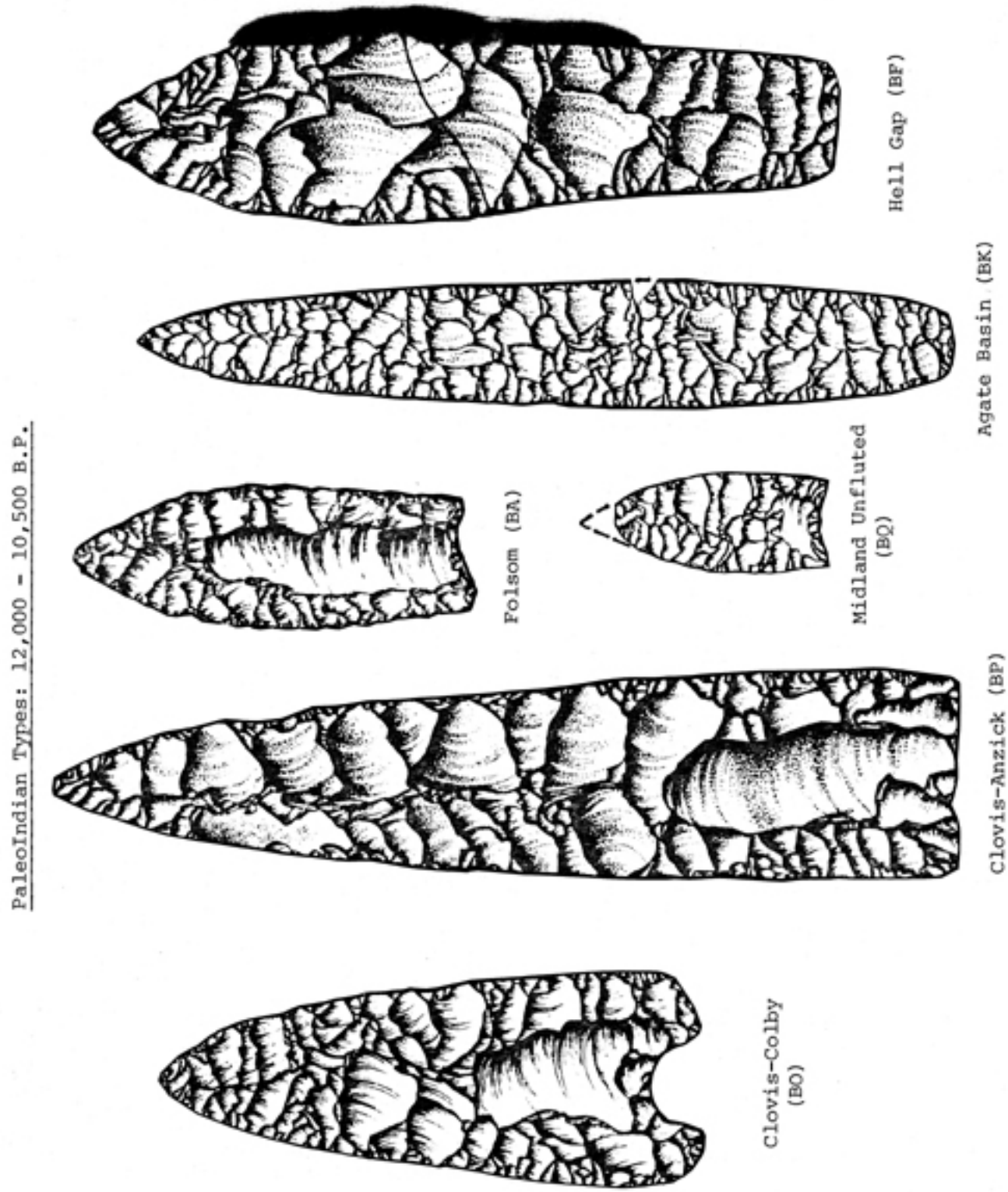
Stemmed

Lanceolate

Triangular

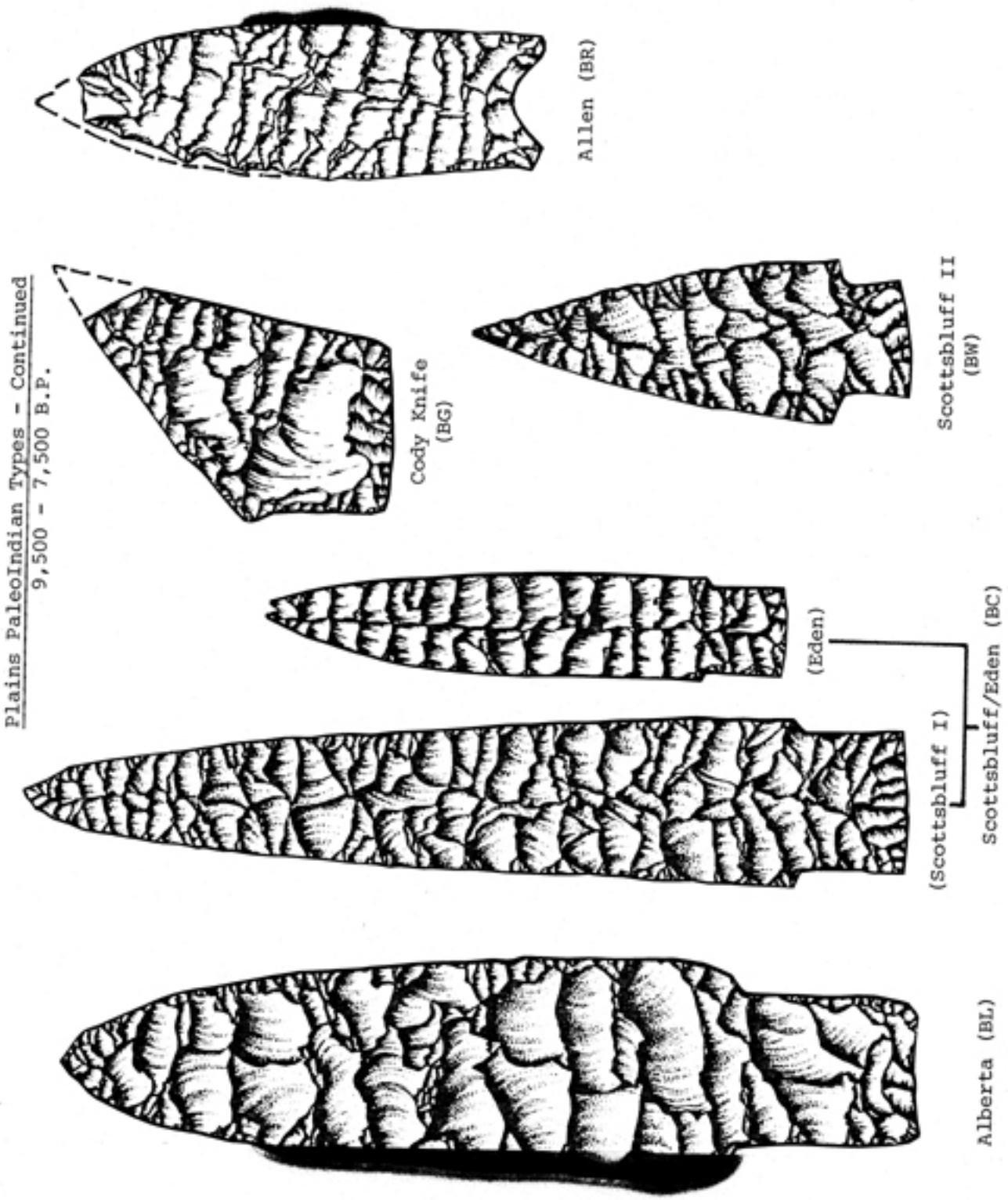
Note: Large triangular "points" may actual]

440.4 WYOMING PROJECTILE POINT ILLUSTRATIONS (after Frison 1978)*



*Prehistoric Hunters of the High Plains

440.4 WYOMING PROJECTILE POINT ILLUSTRATIONS (after Frison 1978)*

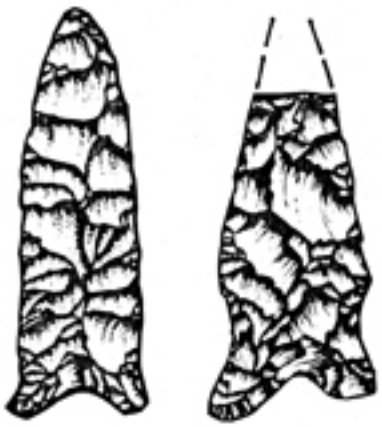


440.4 WYOMING PROJECTILE POINT ILLUSTRATIONS (after Frison 1978)*

Mountain PaleoIndian Types: 10,000 - 8,000 B.P.

Plainview (BX)

Medicine Lodge Lanceolates (BT)



Medicine Lodge Split Base (BV)

Medicine Lodge Round Base (BU)

Pryor Stemmed (BS)

440.4 WYOMING PROJECTILE POINT ILLUSTRATIONS (after Frison 1978)*

Early Plains Archaic: 8,500 - 5,000 B.P.

Lookingbill
(CY)

Laddie Creek
(CK)

Wedding of
the Waters
(C3)

Hawken
Side-notched
(CG)

Middle Plains Archaic: 5,000 - 2,500 B.P.

Yonkee (C1)

Hanna (CQ)

Duncan (CP)

McKean
Lanceolate
(CE)

Mallory (CR)

440.4 WYOMING PROJECTILE POINT ILLUSTRATIONS (after Frison 1978)*

Late Plains Archaic: 2,500 - 1,500 B.P.

Besant (CT)

Pelican Lake (CU)

Lake Prehistoric: 1,500 - 200 B.P.

Avonlea (DK)

Plains Side-notched (EO)

Prairie Side-notched (DQ)

Farson Tri-notched (EE)

Triangular Unnotched (C4)

445 - Flaking Stages

Decortication - Any unutilized flakes produced from core reduction usually with large amounts of cortex on the dorsal surface. Greater than 30 mm in size.

Secondary Flake - Any unutilized flake produced from core reduction with little cortex on the dorsal surface compared to large primary flakes. Between 15-30 mm in size.

Tertiary Flake (Primary Thinning) - Any unutilized flake from core reduction with less than 1% cortex on the dorsal surface and/or three or more dorsal flake scars. Less than 15mm in size.

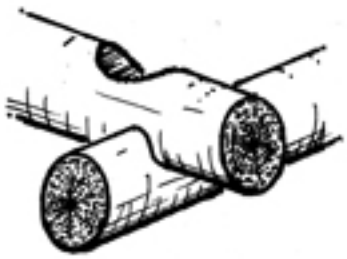
Shatter - Unmodified piece of material produced from core reduction without definite flake attributes.

Core - Any nucleus of raw material from which flakes have been detached.

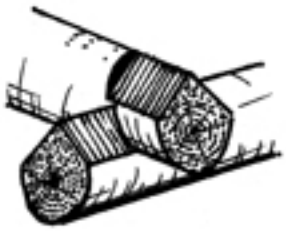
450 - CABIN NOTCHING ILLUSTRATIONS

See Illustrations file.

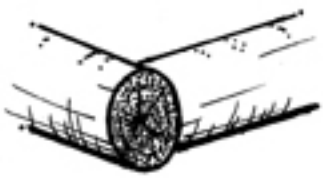
450 - CABIN NOTCHING ILLUSTRATIONS



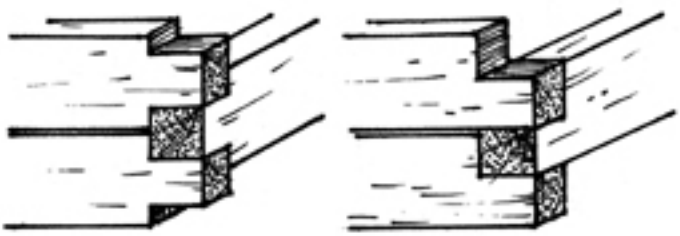
Saddle (CC)
May be notched on top, bottom, or both sides.



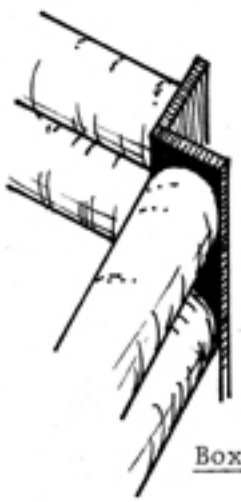
Steeple or V (CD)



False Notching (CH)
Note the lack of overlapping, alternating tiers of logs.



Two Examples of Square Notching (CG)



Boxed Corner
(CQ)

Half Dove Tail (CF)
Note 90° corner.

Full D[illegible] Tail (C[illegible])

455 - LIFE ZONES *

(A) Arctic-Alpine - Above timberline; mostly grasses.

(B) Hudsonian - High mountain forest; Alpine fir, Spruce, willows; 9000 to 11000 feet.

(C) Canadian - Mountain conifers; Douglas fir, Ponderosa and Lodgepole pine, Aspen; 8000 to 9000 feet.

(D) Transitional - Foothills and drier mountain areas; Mountain Mahogany, Oak brush, some Ponderosa pine; 7000 to 8000 feet.

(E) Upper Sonoran - Cool desert foothills or high valleys; pinyon- juniper, sagebrush, grasses; 6000 to 7000 feet.

(F) Lower Sonoran - Warm desert; sagebrush, rabbitbrush, cacti, creosote; under 6000 feet.

*Elevations are only approximate and any zone will be 1000 to 1500 feet lower in the north than in the south (Steward, 1938).

GUIDE TO VEGETATION COMMUNITY CODES

The following guide supplies information for filling out 310 - Part A, Environmental Data - 34. Vegetation. Definitions are supplied for the various vegetation communities. The definitions are ordered on the basis of ascending elevation, as shown on the chart below.

Community	Code
Creosote Bush	Y
Blackbrush	V
Shadscale	O
Big (Tall) Sagebrush	P
Little (Low) Sagebrush	Q
Pinyon-Juniper	H
Oak-Maple Shrubland	K
Dry Meadow	J
Wet Meadow	I
Ponderosa Pine	E
AspenA	
Douglas Fir	C
Lodgepole Pine	F
Spruce/Fir	B
Alpine Tundra	D

460 - VEGETATION COMMUNITY GUIDE

The following is either paraphrased or verbatim from Intermountain Flora by A. Cronquist, A. Holmgren, N. Holmgren, and J. Reveal, Volume 1, 1972, Hafner Publishing Company, Inc. pp. 109-131.

We have modified Cronquist, et al. "zones" somewhat and used here to illustrate what is called "community" in IMACS. They are only roughly equivalent. Following the community code name is the appropriate IMACS code.

This breakdown of the Intermountain Region into vegetation zones is taken in part from Billings (1951) who subdivided the Great Basin into zones that can easily be recognized. For a good review of different treatments of vegetation zones in the Intermountain Region, see Graham (1937), who reviews the concepts of Merriam (1898), Jones (1910), Rydberg (1916, 1922), Tidestrom (1925), Shantz (1925), Sampson (1925), Cottam (1929), Svihla (1932), and Dixon (1935).

A vegetation zone is, according to Billings (1951, p.103), "a large climax unit whose boundaries are caused primarily by the effects of climate and soil on the distribution of the dominant species of the zone." In the Intermountain Region the boundaries are irregular, due to topographic and geologic variation and their consequent effects on microclimates. Adding to the complexity of delineating a vegetation zone is the mosaic of smaller groupings of species due to even smaller environmental differences. Also, throughout most of any given zone there is a gradient from one environment to another which is often gradual so that the climax vegetation shows gradual shifts in composition from place to place. There are, on the other hand, a vast amount of instances of sharp differences between vegetation types where there are water courses, steep mountain slopes, or abrupt edaphic (soil) changes. The exact boundaries in the kind of macro-classification into which a vegetation zone fits are necessarily arbitrary, since the different influences suggested above result in the merging or interfingering of different zones.

In Intermontane Valley Zones are Creosote Bush (Warm Desert Shrub), Shadscale (Salt Desert Shrub), Sagebrush, and Pinyon-Juniper. They replace each other more or less latitudinally from south to north, and altitudinally from low to high elevations. The Creosote Bush Zone is replaced approximately along the 37th parallel by the Shadscale Zone. The Shadscale Zone extends northward in the valley bottoms. In the low depressions of the Lahontan and Bonneville basins it extends up to the 42nd parallel. The northernmost Sagebrush Zone extends south along the slopes of the mountains so that the boundary between this and the Shadscale Zone tends to dovetail considerably. The Pinyon-Juniper Zone is more or less associated with the mountains but is common enough in the higher valleys to be considered with the Valley Zones.

The community descriptions presented here are generalized to cover many different local environmental variations. It would be a rare case to find that a community description and plant list duplicates the field situation. The guide should be used to help the field archeologist make a reasonable assessment of community type by comparing the field situation to the community descriptions and encoding the best match.

On-Site Community Codes:

(A)	Aspen	(O)	Shadscale/Greasewood
(B)	Spruce/Fir	(P)	big Sagebrush
(C)	Douglas Fir	(Q)	Little Sagebrush (Low
(D)	Alpine		(Low Sagebrush)
(E)	Ponderosa	(R)	Barren
(F)	Lodgepole Pine	(S)	Marsh/Swamp
(G)	Other/Mixed Conifer Forest	(T)	Lake/Reservoir
(H)	Pinyon-Juniper	(U)	Agricultural/Developed/
(I)	Wet Meadow		Seedings
(J)	Dry Meadow	(X)	Prairie (short grasses)
(K)	Oak-Maple Shrubland (deciduous	(W)	Mountain Brush
	tree/shrub)	(2)	Juniper/Sage
(L)	Riparian	(Z)	Unknown
(M)	Grassland/Steppe		
	(bunch grasses)		

(A) Aspen Community

Aspen (*Populus tremuloides*), is scattered throughout the upper levels of the Douglas fir zone, but at lower levels may be restricted to stream-side sites. Aspen often forms pure stands or dominates a community consisting of smaller trees and shrubs. The aspen, frequently found in burned-over areas, has the reputation of being an invader of burns.

Aspen is common and often forms large clones throughout the mountainous areas of Wyoming, mostly at 6,000-10,000 feet but at somewhat lower elevations in the Black Hills of northeastern Wyoming.

Some of the associated plants are:

Acer glabrum (Rocky Mountain maple)
Acer grandidentatum (big tooth maple)
Berberis repens (Oregon grape)
Betula occidentalis (western water birch)
Bromus anomalus (nodding brome)
Carex geyeri (elk sedge)
Geranium spp. (geranium)
Hydrophyllum capitatum (waterleaf)
Juniperus communis (creeping juniper)
Lupinus spp. (lupine)
Melica spp. (onion grass)

Nemophila breviflora (nemophila)
Penstemon subglaber (penstemon)
Phacelia sericea (phacelia, purple fringe)
Poa pratensis (Kentucky bluegrass)
Poa nervosa (Wheeler bluegrass)
Populus angustifolia (narrow leaf cottonwood)
Salix spp. (willow)
Scorphularia lanceolata (figwort)
Smilacina spp. (false soloman's seal)
Stipa columbiana (columbia needlegrass)
Symphoricarpos oreophilus (snowberry)
Thalictrum fendleri (meadow-rue)
Wyethia amplexicaulis (mules-ear)

(B) Spruce/Fir Forest

This is the characteristic element at the upper limit of trees, but may extend downward along streams into lower valleys. Near its upper limit the trees are scattered, but the main belt is almost continuous forest. The chief trees are englemann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*), but in northwestern Wyoming whitebark pine (*Pineus albicaulis*) is a frequent constituent, particularly on rocky or exposed sites. In mature stands the understory is frequently composed of grouse whortleberry (*Vaccinium scoparium*). At the upper limit of this forest the trees become dwarfed, forming characteristic wind-timber islands of trees contorted by high winds and blowing snow. Within the forest, in more open situations or along streams, we find numerous willows and aspen (*Populus tremuloides*).

Abies lasiocarpa (subalpine fir)
Picea engelmannii (englemann spruce)
Pinus albicaulis (whitebark pine)
Pinus flexilis (limber pine)
Populus tremuloides (aspen)

The most common understory taxa are:

Artostaphylos uva-urse (manzanita, bearberry)
Arnica cordifolia
Artemisia tridentata (big sagebrush)
Camanula rotundifolia (common harebell)
Cares spp. (sedge)
Chrysothamnus viscidiflorus (rabbitbrush)
Calamogrostis spp. (pinegrass)
Fragaria virginiana (strawberry)
Juniperus communis var. depressa (common juniper)
Penstemon whippleannus (penstemon)
Phlox spp. (phlox)
Pyroela spp.
Ribes cereum (wax or squaw currant)
Ribes montigenum (mountain currant)
Rebus ideaeus (raspberry)
Sambucus racemosa (red elderberry)

Stipa spp. (needlegrasses)
Symphoricarpos oreophilus (mountain snowberry)
Trisetum spicatum (spike trisetum)
Vaccinium scoparium (grouse whortleberry)

(C) Douglas Fir Community

Douglas fir (*Pseudotsuga menziesii*), has a wide ecological amplitude, usually dominating most of the areas under different climatic and edaphic influence within the Canadian zone and often extending to lower elevations than other tree species of the zone. The blue spruce, *Picea pungens*, is common to this community in the southern parts of the region but is only found along the extreme western edge of Wyoming and in the southern parts of the Medicene Bow Mountains. In dry areas and exposed slopes in the upper reaches of this zone, the limber pine (*Pinus flexilis*) is common. Similar habitats at lower elevations are often occupied by ponderosa pine (*Pinus ponderosa*).

Common trees are:

Abies concolor (white fir)
Picea pungens (blue spruce)
Pinus flexilis (limber pine)
Pinus ponderosa (ponderosa pine)
Populus tremuloides (aspen)
Pseudotsuga menziesii (Douglas fir)

As one ascends in elevation, winds become stronger. The dense stands of Douglas fir and aspen growing close together receive mutual protection from their own kind thus acting as windbreaks against toppling in the highwinds. The canopy allows less light to penetrate than in the open ponderosa pine forests. Only shrubs and trees that can tolerate the reduced shade produced by the fir and aspen can survive here.

Such plants, among others, are:

Amelanchier alnifolia (serviceberry)
Berberis repens (Oregon grape)
Cornus stolonifera (red osier dogwood, kinnikinnik)
Lonicera spp. (honeysuckle)
Pachistma myrsinites (mountain clover, myrtle)
Prunus virginiana (chokecherry)
Ribes cereum (wax currant)
Ribes montigenus (mountain gooseberry)
Rubus parviflorus (thimbleberry)
Rubus ideaus (raspberry)
Salix spp. (willow)
Sambucus cerulea (blue elderberry)
Sorbus scopulina (mountain ash)
Vaccinium scoparium (grouse whortleberry)

(D) Alpine

The alpine tundra typically consists of low perennial herbs. The climatic forces are too severe for the growth of trees. Most of the communities represent early successional stages because not only have they recently been exposed by the retreat of the Pleistocene glaciers, but the plants have such short growing seasons and are exposed to freezing night temperatures. The soils are usually shallow and poorly decomposed. Also the ruggedness of the mountain top terrain allows few places for soil to develop. Most alpine situations in the Intermountain Region are limited to the tops of mountain peaks and consist almost entirely of rock slides and deep piles of loose boulders with very few environments suitable for the development of vegetation. In the Uinta Mountains, however, a good proportion of this alpine area consists of gently undulating terrain providing an environment more similar to that found in the arctic regions. A good source for more information on this zone is Lewis (1970).

In Wyoming this zone is mostly above 10,500 feet in elevation. It is composed of alpine tundra, rocky summits, scree slopes, alpine lakes, meadows, stream channels, permanent or temporary snowbanks, and in some places glaciers. The vegetation is chiefly herbaceous, with a few low or dwarf shrubs.

Woody species found here include:

Juniperus communis (common juniper)
Potentilla fruticosa (shrubby cinquefoil)
Ribes montigenum (mountain currant, gooseberry)
Phleum aplinum (alpine timothy)
Salix brachycarpa (barren ground willow)
Salix spp. (dwarf or shrubby willows)

Other associated plants include:

Agropyron spp. (wheatgrass)
Agrostis variabilias (red top)
Carex spp. (sedge)
Deschampsia cespitosa (oatgrass, tufted hairgrass)
Festuca ovina (sheep fescue)
Juncus spp. (rush)
Muhlenbergia filiformis (pull-up muhly)
Phleum aplinum (alpine timothy)
Poa alpina (alpine bluegrass)
Polygonum spp. (bistorts, knotweed, smartweed)
Trifolium spp. (clover)
Trisetum spicatum (spike trisetum)

Many of these plants are found in all the alpine zones of Wyoming, but some of them have thus far been observed only in northwestern Wyoming, where the best development of this zone occurs in the Wind River Range and on the Beartooth Plateau.

The principal forbs are:

Astragalus playtopis (milkvetch)
Castilleja spp. (Indian paintbrush)
Draba spp. (whitlow-wort)
Erigeron compositus (daisy)
Geum rossii var. turbinatum (avens)
Lewisia pygmaea (pigmy bitterroot)
Lupinus argenteus (lupine)
Mertensia ciliata (tall bluebell)
Oxyria digyna (alpine sorrel)
Penstemon spp.
Polemonium viscosum (sky pilot)
Polygonum bistortoides (knotweed)
Potentilla diversifolia (cinquefoil)
Rannunculus eschscholtzii var. *alpinus* (subalpine buttercup)
Saxifraga caespitosa (matted saxifrage)
Senecio werneriaefolius (golden ragwort)
Silene acaulis (moss-pink)
Smelowskia calycina var. *americana* (smelowskia)
Vaccinium caespitosum (blueberry)

(E) Ponderosa Pine Community

Both the oak-maple schrub (chaparral) and ponderosa pine occupy more or less the same altitudinal belt, which lies between 5,000 and 7,000 feet in the Wasatch Range and between 6500 and about 9000 feet at the more southern latitudes. Ponderosa pine, *Pinus ponderosa*, is called yellow pine by some authors. The ponderosa pine communities are open forest with medium tall to tall trees (up to 100 feet tall with a relatively sparse understory of various admixtures of shrubs and herbs. Even though the sunlight reaches the ground in almost all parts of such a forest, the shrub layer is relatively spotty compared to its development in the ponderosa pine forests of the Northwest. The soil is relatively dry and sandy, containing little or no humus. The trees are straight and evenly spaced with the forest consisting of widely spaced individuals or the trees may grow in relatively open, parklike stands on rather dry hillsides and plateaus. On the cool north slopes, the stands of ponderosa pine tend to be thicker, and the douglas fir intermingles with them, and in the upper parts, aspen creeps downward to associate with the ponderosas.

Characteristic shrubs are:

Acer glabrum (Rocky Mountain maple)
Amelanchier alnifolia (serviceberry)
Arctostaphylos spp. (manzanita, bearberry)
Berberis repens (Oregon grape)
Ceanothus fendleri (Fendler buckbrush)
Chrysothamnus parryi (rabbitbrush, montane)
Crataegus rivularis (hawthorn)
Juniperus scopulorum (Rocky Mountain juniper)
Purshia tridentata (bitterbrush, antelope brush)
Ribes cereum (wax currant)

Robina neomexicana (New Mexican locust)
Subus spp. (raspberry)
Sambucus coerluea (blue elderberry)
Symphoricarpos spp. (snowberry)

The most common grasses are:

Agropyron spp. (wheatgrasses)
Blepharoneuron tricholepis (hairy dropseed)
Calamagrostis spp. (pinegrasses)
Muhlenbergia montana (muhly)
Sitanion hystrix (squirreltail)
Stipa spp. (needlegrasses)

Common forbs are:

Astragalus spp. (milkvetch)
Castilleja linariaefolia (Wyoming paintbrush)
Erigeron divergens (spreading fleabane, daisy)
Eriogonum spp. (buckwheat)
Lewisia rediviva (bitterroot)
Lupinus spp. (lupine)
Potentilla spp. (cinquefoil)
Prunus virginiana (chokecherry)
Rosa woodsii (woods rose)

(F) Lodgepole Pine Forest

The lodgepole pine, Pinus contorta var. *latifolia*, dominates an altitudinal belt between 9,000 and 10,000 feet in the Uinta Mountains. It is known to invade recently burned areas. The Rocky Mountain lodgepole pine is a closed-cone species. Such cones retain the seeds for long periods of time but readily release them following a fire or a cutting. The resulting forests are characterized by uniformly thick stands "thick as hairs on a dogs back" where the dense shade prevents the propagation of its own seedlings. The trees are so crowded together that it is almost impossible to push through them. The trunk diameter is commonly no more than a foot, with "doghair" stands averaging more like 5 to 6 inches. In such groves, the trees seldom exceed 75 feet in height and bear branches only near their tops (Elmore 1976:181).

The lodgepole pine invades the burns in the lower levels of the Englemann spruce-Subalpine Fir zone where its role as the preclimax is evident for the climax species are seen gradually replacing the lodgepole pine. Lodgepole pine is present only in small quantities in the Wasatch Range. In the mountains just north of the Wasatch it dominates as it does in the Uinta Mountains.

Common taxa in the understory are:

Arctostaphylos uva-ursi (manzanita)
Arnica cordifolia (arnica)
Betula occidentalis (western water birch)

Ceanothus velutinus (sticky-laurel)
Cercocarpus montanus (alderleaf mountain mahogany)
Chrysothamnus viscidiflorus (rabbitbrush)
Gutierrezia sarothrae (snakeweed)
Juniperus communis var. *depressa* (common juniper)
Pachistima myrsinities (mountain lover)
Pedicularis racemosa var. *alba* (lousewort)
Populus angustifolia (narrowleaf cottonwood)
Prunus virginiana (chokecherry)
Purshia tridentata (bitterbrush)
Rhus trilobata (squawbrush)
Ribes cereum (wax currant)
Ribes spp. (currant)
Rosa woodsii (woods rose)
Rubus parviflorus (thimbleberry)
Salix spp. (willow)
Sambucus cerula (red elderberry)
Sambucus racemosa var. *microbotrys* (elderberry)
Symphoricarpos oreophilus (mountain snowberry)
Vaccinium scoparium (broom huckleberry)

The common herbaceaous species are:

Agropyron spp. (wheatgrass)
Delphinium nelsonii (larkspur)
Elymus cinereuss (giant wild rye)
Erigeron flagellaris (trailing fleabane)
Geranium fremontii (fremont geranium)
Poa pratensis (Kentucky geranium)
Stipa spp. (needlegrass)
Vigueria multiflora (showy goldeneye)
Wyethia amplexicaulis (mules-ear)

In Wyoming: Occupying the middle part of the timbered mountain slopes there is usually present a broad and dense forest of lodgepole pine (*Pinus contorta* spp. *latifolia*). This belt of coniferous forest is often the most conspicuous part of the mountain slopes. Occasional mature stands occur, with well-spaced trees and an understory of shrubs such as Canadian buffaloberry (*Shepherdia canadensis*) and common juniper (*Juniperus communis*). But commercial logging as well as fire have resulted in most of the stands being less mature and more dense. After fire, particularly, this forest returns as a very dense and slowly maturing stand of closely spaced, slender trees, with very little development of an under-story. Here, also, we find numerous streams, ponds, and lakes that are highly productive of plant life. There are frequent openings or parks that are grassy or are occupied by sagebrush (*Artemisia tridentata*). Aspen occurs as a conspicuous element around the edges of the forest, and in moist situation along streams are numerous willows.

Common trees are:

Pinus contorta (lodgepole pine)
Populus tremuloides (aspen)

Common understory taxa are:

Abies lasiocarpa (subalpine fir)
Artemisia tridentata (big sagebrush)
Juniperus communis (common juniper)
Picea engelmannii (englemann spruce)
Shepherdia canadensis (Canadian buffaloberry)
Vaccinium scoparium (grouse whortleberry)

(G) Mixed Conifer Forest

This forest type marks the lower limit of the tree-clad mountain slopes, occurring below the lodgepole pine forest and extending downward in a rather narrow belt to the open foothills. In northeastern Wyoming, however, and in scattered areas in eastern Wyoming generally, this is often a broad belt extending out onto the plains. The chief trees are ponderosa pine (*Pinus ponderosa* var. *scopulorum)* and Douglas fir (*Pseudotsuga menziesii* var. *glauca*), but we find limber pine (*Pinus flexilis*) and aspen (*Populus tremuloides*) associated with them in many places. The forest is more open than the lodgepole pine forest, the trees often being widely spaced. The common understory is sagebrush (*Artemisia tridentata*) and bitterbrush (*Purshia tridentata*). On the more sheltered and moister slopes there is sometimes an almost pure stand of Douglas fir. Limber pine is usually associated with exposed, rocky sites. Along the lower streams balsam poplar (*Populus balsamifera*) may occur as scattered individuals or a nearly pure stand.

Some of the associated plants are:

Artemisia tridentata (big sagebrush)
Pinus flexilis (limber pine)
Pinus ponderosa (ponderosa pine)
Populus balsamifera (balsam poplar)
Populus tremuloides (aspen)
Pseudotsuga menziesii (Douglas fir)
Purshia tridentata (bitterbrush, antelope brush)

(H) Pinyon-Juniper Community

The Pinyon-Juniper zone is often treated as a montane zone. This forest type occupies more area in the Intermountain Region than all the other forest types combined. The elevational range of the zone varies, but it usually is found between 5000 and 8000 feet, with the lower limits determined by lack of moisture. The pinyon-juniper woodland develops in areas where the annual precipitation is usually in excess of about 12 inches. This zone has been variously called the Upper Sonoran Zone, Plains or Woodlands Zone.

Structurally the pinyon-juniper community consists of low, evergreen trees which rarely exceed 20 feet in height, are usually spaced far enough apart that their branches do not touch, and have an understory of varying admixture of shrubs and herbaceous plants, often with nearly bare ground.

Although rather uniform in basic structure throughout the Region, the p-j woodland changes composition both altitudinally and geographically. The juniper is found in pure stands at the lower elevational limits of the zone and often extends into the Sagebrush Zone along the side of draws. At somewhat higher elevations the pinyon enters the association, forming a mixed woodland throughout the middle part and eventually replacing the juniper in the extreme upper limits.

The singleleaf pinyon, *Pinus monophylla*, is the pinyon throughout most of the Great Basin. It is replaced in the mountain ranges along the eastern side of the Basin by Pinus edulis, two needle pinyon, which is the pinyon throughout the Colorado Plateau and the Uinta Mountains.

The Utah juniper, *Juniper osteosperma*, is the most common species of juniper in the Intermountain Region. It is a relatively short tree rarely exceeding 20 feet in height, is typically shrub like in form, with more than one main branch arising at or near the ground level.

In all except the western part of the Region, the Rocky Mountain juniper, Juniperus scopulorum, occurs along streams and in dry washes where it often extends up into the next zone. Apparently it is less drought-enduring then J. osteosperma and is less frequent. The Rocky Mtn. juniper is a larger tree, up to 30 or 40 feet in height with a central trunk.

Just entering our Region in southeastern Utah (San Juan and Kane counties), the one-seed juniper, *J. monosperma*, a small shrubby tree, dominates the drier sites. In this region it is the first arborescent species that one sees going from lower to higher elevations, where the Utah juniper and pinyon replace it.

Big sagebrush (*Artemisia tridentata*) is the common undercover shrub of the p-j woodland. Cacti and yuccas creep upward into the lower reaches and scraggly ponderosa pines edge downward into the upper border along with Gambel oaks. Along the streams grow cottonwoods, walnuts and sycamores, while on drier sites you can find such as rabbitbrush, fernbush, cliffrose, Apache-plume, squaw bush and scrub oak, any of which may assume local dominance (Elmore 1976:13).

Dominant trees:

Pinus edulis (two-needle pinyon)
Pinus monophylla (single-needle pinyon)
Juniperus monosperma (one-seed juniper)

Juniperus osteosperma (Utah juniper)
Juniperus scopulorum (Rocky Mountain juniper)

Some of the other more or less common shrubs are:

Acer glabrum (Rocky Mountain maple)
Amelanchier alnifolia (serviceberry)
Ceanothus velutinus (mountain lilac)
Cercocarpus ledifolius (curl-leaf mountain mahogany)
Chrysothamnus nauseosus (big rabbitbrush)
Chrysothamnus viscidiflorus (rabbitbrush)
Cowania mexicana var. *stansburiana* (stansbury cliffrose)
Ephedra viridis (Mormon tea)
Gutierrezia sarothrae (snakeweed)
Holodiscus dumosus (rock spiraea)
Purshia tridentata (bitterbrush)
Quercus gambelii (Gambel oak)
Ribes cereum (wax gooseberry)
Ribes velutinum (gooseberry)
Sambucus racemosa (red elderberry)
Symphoricarpos oreophilus (mountain snowberry)
Tetradymia canescens (horsebrush)

The most common grasses, which are more abundant in the northern parts of the Region are:

Agropyron smithii (western wheatgrass)
Agropyron spicatum (bluebunch wheatgrass)
Bouteloua gracilis (blue grama)
Festuca idahoensis (bluebunch fescue)
Koeleria cristata (prairie junegrass)
Oryzopsis hymenoides (Indian ricegrass)
Poa fendleriana (muttongrass)
Poa sandbergii (sandberg bluegrass)
Sitanion hystrix (squirreltail)
Sporobolus cryptandrus (sand dropseed)
Stipa columbiana (subalpine needlegrass)
Stipa comata (needle and thread)
Stipa thurberiana (thurber needlegrass)

Some of the common forbs are:

Astragalus spp. (milkvetch)
Balsamorhiza sagittata (arrowleaf balsamroot)
Erigeron spp. (daisy)
Eriogonum spp. (buckwheat)
Gilia aggregata (skyrocket)
Grindelia squarrosa (gumweed)
Lupinus sericeus (silky lupine)
Penstemon spp. (penstemon)

(I) Wet Meadow Community

The wet meadow community typically occupies level to nearly level stream valley bottoms and lowlands with a fairly high water table. Meadows and lakes are also frequently found associated with spruce-fir forests. The majority of these wet meadows represent advanced stages in the gradual filling in of the shallower glacial lakes.

In the wet meadows bordering the lakes, streams, and filled in lakes are such plants as:

Agrostis thurberiana (thurber redtop, thurber bentgrass)
Betula spp. (birch)
Caltha leptosepala (marsh marigold)
Castilleja spp. (paintbrush)
Cares spp. (sedge)
Deschampsia cespitosa (tufted hairgrass)
Erigeron spp. (daisy)
Juncus spp. (rush)
Kalmia polifolia var. *microphylla* (swamp laurel, bog laurel)
Lonicera involucrata (bush honeysuckle)
Luzula spp. (wood-rush)
Menyanthes trifoliata (buckbean, bog bean, marsh trefoil)
Mertensia ciliata (tall bluebells)
Mimulus lewisii (monkey flower)
Pedicularis groenlandica (elephantella, elephanthead lousewort)
Phleum alpinum (alpine timothy)
Poa spp. (bluegrass)
Polygonum bistortoides (knotweed, bistort)
Potentilla fruticosa (shrubby cinquefoil)
Primula parryi (parry primrose)
Ranunculus spp. (buttercup)
Rumex spp. (dock)
Salix phylicifolia (planeleaf willow)
Sparganium angustifolium (narrow-leaf bur-reed)
Vaccinium occidentale (blueberry)

(J) Dry Meadow

"Dry" meadows, also called mountain parkland meadows, typically occur on level to sloping topography of 20 percent or less along drainages and basins at elevations from 8,500 to 10,000 feet. This community type often exhibits frost hummocks and usually intergrades with the spruce/fir and other conifer forests. They are characterized by an abundance of forbs, cool season grasses, and sedges. The species composition of these herbaceous dry meadows varies greatly from place to place, depending on the angle and direction of the slope, the physical properties of the soils, altitude, and moisture availability. The dominant vegetation varies from a sedge/willow aspect on moist sites to a grass/forb aspect on the drier areas.

They may contain the following taxa:

Achillea millefolium var. *lanulosa* (yarrow)
Agropyron spp. (wheatgrass)
Agrostis spp. (redtop, bentgrass)
Artemisia frigida (fringed mountain-sage, pasture mountain-sage)
Artemisia michauxiana
Aster foliaceus (aster)
Bromus spp. (brome)
Carex spp. (sedge)
Castilleja sulphurea (yellow paintbrush)
Cirsium spp. (thistle)
Delphinium barbeyi (subalpine larkspur)
Deschampsia cespitosa (tufted hairgrass)
Festuca spp. (fescue)
Geranium richardsonii (white geranium)
Lewisia pygmaea (pigmy bitterroot)
Ligusticum filicinum (fern-leaf lovage)
Muhlenbergia filiformis (pull-up muhly)
Pedicularis racemosa var. *alba* (curled lousewort)
Penstemon spp. (penstemon)
Phacelia heterophylla (caterpillar plant, varileaf phacelia)
Phleum alpinum (alpine timothy)
Poa spp. (bluegrass)
Polygonum bistortoides (knotweed, bistorts)
Ranunculus escholtzii (alpine buttercup)
Rumex paucifolius (dock)
Saxifraga rhomboidea (saxifrage, diamondleaf)
Stipa columbiana (subalpine needlegrass)
Stipa lettermanii (letterman needlegrass)
Taraxacum officinale (common dandelion)
Trisetum spicatum (spike trisetum)
Vaccinium spp. (blueberry, huckleberry)
Viguiera multiflora (showy goldeneye)
Viola spp. (violet)

(K) Oak-maple Shrubland Community

The oak-maple shrubland (chaparral or shrub woodland) consists of deciduous or semi-deciduous large shrubs that form dense to open vegetation. The dominant species over most of the area are Gambel oak (*Quercus gambelii*) and big-tooth maple (*Acer grandidentatum*). In northern Utah this zone is transitional between the sagebrush zone and the typical Wasatch chaparral from further south. Big sagebrush (*Artemisia tridentata*) may dominate the lower limits and mountain mahogany (*Cercocarpus ledifolius*) the upper, with a deep penetration from the zone above of Douglas Fir (*pseudotsuga menziesii*) and aspen (*Populus tremuloides*)on the north-facing slopes. Further south in the Wasatch Range, on the lower slopes overlooking Salt Lake and Utah valleys, is the more characteristic Gambel oak/bit-tooth maple vegetation which extends from about the highest shoreline of old Lake Bonneville at about 5100 feet to an average of 7500 feet. There is the usually extension of the zone upwards on the southern-facing slopes and downward on the cooler north-facing slopes. It is

characterized by thickets of tall shrubs when the Gambel oak is the dominant species.

Throughout the range of the chaparral formation, mountain mahogany usually dominates the upper limits, sometimes forming a woodland. In the loccolithic mountains the Gambel oak forms interrupted communities between 6000 and 8000 feet in the draws, alternating variously with pinyon-juniper woodland and ponderosa pine forest.

In Wyoming: The typical oak-maple shrubland as described in the IMACS Guide is not found in Wyoming. Gambel oak (*Quercus gambelii*) is not known to occur in the State except possibly in the extreme southwest corner of the State and in the Big Horn Mountains. Big-tooth maple is known almost exclusively from the western slopes of the Big Horn Mountains in association with mountain mahogany. Most Wyoming "shrub-woodland" communities would more appropriately be categorized as (W) (mountain brush); however, there are many areas of the State where deciduous trees and shrubs are found in sufficient quantities to be considered communities. Areas of the Black Hills, for example, where bur oak (*Quercus macroparpa*) and boxelder (*Acer negundo*) dominate should be coded to this community.

The following taxa are found here:

Acer grandidentatum (big-tooth maple)
Acer glabrum (Rocky Mountain maple)
Acer negundo (boxelder)
Amelanchier alnifolia (serviceberry)
Amelanchier utahensis (Utah serviceberry)
Artemisia arbuscula var. *nova* (black sagebrush)
Artemisia tridentata (big sagebrush)
Cercocarpus ledifolius (curlleaf mountain mahogany)
Quercus macroparpa (bur oak)
Quercus gambelii (Gambel oak)

(L) Riparian

Riparian communities are those in which the vegetation is related to, living on, or located on the bank of a natural watercourse. The term riparian is sometimes, but rarely, applied to lakes. Along major drainages such as those of the North Platte, Powder, Big Horn, and Green rivers, the bottom land is usually wooded, the chief tree being plains cottonwood (*Populus sargentii*), often associated with boxelder (*Acer negundo*) and peach-leaved willow (*Salix amygdaloides*). In northeastern Wyoming there are also bur oak (*Quercus macroparpa*), elm (*ulmus americana*), and green ash (*Fraxinus pennsylvanica*). In many places thickets of lower trees and shrubs occur, composed largely of silverberry (*Elaeagnus commutata*), buffaloberry (*Shepherdia argentea*), rose (*Rosa* spp.), sand-bar willow (*Salix exigua*), and rubber rabbitbrush (*Chrysothamnus nauseosus*). In many places in the introduced and weedy salt cedar (*Tamarix pentandra*) occurs in stream channels or along sandbars. In some places there are extensive marshy areas occupied by cattail

Typha latifolia) and various rushes (*Juncus* spp.) andsedges (*Cares* spp.). Numerous large reservoirs and a few natural lakes occur here containing beds of elodea (*Elodea canadensis*), pondweed (chiefly *Potamogeton pectinatus*), bullrush (*Sarpus* spp.), and rushes (*Juncus* spp.). The ground cover of the bottoms is largely grassland where there is sufficient moisture, but in drier areas the desert flora extend right up to the stream margins.

Common woody taxa are:

Acer negundo (boxelder)
Chrysothamnus nauseosus (rubber rabbitbrush, big rabbitbrush)
Elaeangnus commutata (silverberry)
Fraxinus pennsylvanica (green ash)
Populus sargentii (plains cottonwood)
Populus angustifolium
Quercus macroparpa (bur oak)
Rosa spp. (rose)
Salix amygdaloides (peach-leaved willow)
Salix exigua (sandbar willow)
Shepherdia argentea (buffaloberry)
Ulmus americana (elm)

(M) Grassland/Steppe

This is a broad belt of grassland extending from southeastern Wyoming, east of the Laramie Range, northward toward the Black Hills. These rolling hills and plains lying at an elevation between 4500 and 6000 feet, are covered with a rather uniform stand of relatively tall grasses and forbs, the belt constituting an extension westward of the Nebraska sandhills flora and that of the Great Plains. Characteristic here are several species of tall grasses, such as needlegrass (*Stipa* spp.), little bluestem (*Andropogon scoparius*), big bluestem (*Andropogon gerardi)*, and sand bluestem (*Andropogon hallii*). The andropogons are rather patchy in most upland areas and are located mostly on hillsides and/or in valleys. Characteristic also are patches of lower grasses such as buffalograss (*Buchloe dactyloides*) and blue grama (*Bouteloua gracilis*), together with other grasses of more general distribution. Soapweed (*Yucca glauca*) is often common on exposed, arid sites, along with prickly pear (*Opuntia polyacantha* and *O. fragilis*). Lupines (*Lupinus* spp.), purple loco (*Oxytropis lambertii*), and a white-flowered beardtongue (*Penstemon albidus*) are showy forbs, and in sandy soils there is abundance of scurfpea (*Psoralea tenuiflora*) and *Calamovifla longifolia*.

Common plants found here are:

Agropyron smithii (western wheatgrass)
Andropogon scoparius (little bluestem)
Andropogon gerardi (big bluestem)
Andropogon hallii (sand bluestem)
Buchloe dactyloides (buffalograss)
Cares spp. (sedges)
Koeleria macrantha

Poa sandbergii (sandberg bluegrass)
Stipa spp. (needlegrass)

(O) Shadscale/Greasewood

This zone has been called the Saltbush Zone by many authors. Shadscale vegetation has been considered an edaphic climax on somewhat saline valley soils. Shadscale does tolerate salt much better than does sagebrush, but apparently it thrives best where the salt content of the soil is relatively low (Kearney et al. 1914). Its presence in valley bottoms of western Nevada where the salt concentration is high is probably just as related to its adaptation to a low moisture requirement as it is a salt tolerance (Billings 1949). In the valley bottoms of western Utah, where the precipitation is higher than 7 inches, the predominance of shadscale may perhaps be explained by its tolerance to periodic drought.

The shadscale community has three principle regions of development, western Nevada (Lahontan Basin), western Utah (Bonneville Basin) and eastern Utah (Uinta Basin and canyonlands). This desert community is typically dominated by low, widely spaced, more or less spiny, grayish, small-leaved shrubs which cover only about 10% of the ground area.

Shrubby species comprisng this community are:

Atriplex confertifolia (shadscale)
Allenrolfea occidentalis (pickleweed, iodine bush)
Artemisia filifolia (sand sage)
Artemisia spinescens (budsage)
Atriplex canescens (4 wing saltbush)
Atriplex nuttallii (saltbush)
Chrysothamnus viscidiflorus (rabbitbrush)
Ephedra nevadensis (Mormon tea)
Eurotia lanata (winterfat)
Grayia spinosa (hopsage)
Gutierrezia sarothrae (snakeweed)
Kochia americana (gray molly)
Lycium cooperi (wolfberry)
Sarcobatus baileyi (greasewood)
Tetradymia glabrata (Horsebrush)

Perennial grasses and forbs:

Hilaria jamesii (galleta grass)
Oryzopsis hymenoides (Indian ricegrass)
Sitanion hystrix (squirreltail grass)
Sporobolus airoides (alkali sacaton)
Stipa speciosa (desert needlegrass)
Cardaria draba (whitetop)
Eriogonum ovalifolium (wild buchwheat)
Machaeranthera glabriuscula var. *villosa* (aster)
Opuntia spp. (prickly pear cacti)

Sphaeralcea ambigua (desert globemallow)
Sphaeralcea graossulariaefolia (gooseberryleaf globemallow)

Annuals (maturing in spring when autumn precipitation has been sufficient):

Bromus tectcrum (cheat grass)
Cryptantha circumscissa (cateye)
Distichlis spicata var. *stricta* (saltgrass)
Eriogonum spp. (wild buckwheat)
Festuca octoflora (sixweeks fescue)
Halogeton glomeratus (halogeton)
Iva nevadensis (mash-elder)
Lepidium perfoliatum (pepper-grass)
Oenothera spp. (evening-primrose)
Salsola kali (Russian thistle)

Where the salt concentration gets too high for greasewood, the iodine bush or pickleweed (*Allenrolfea*) or saltgrass (*Distichlis*) associations develop. These communities are commonly found forming the inner fringe of vegetation around the barren playas, or separating upland communities from salt marsh communities.

Another common community within the Shadscale Zone is southern Utah is the sand sage (*Artemisia filifolia*) community. It is common in sandy soils.

In Wyoming: In highly alkaline places, which are common here, are large communities dominated by greasewood (*Sarcobatus vermiculatus*) and sea blite (*Suaeda* spp.). Bud sage (*Artemisia spinescens*), shadscale (*Atriplex confertifolia*), and kochchia (*Kochia americana*) are common elements. Dry or intermittent stream courses are often marked by large clumps of basin wild ryegrass (*Elymus cinereus*).

Agropyron smithii (western wheatgrass)
Artemisia spinescens (budsage)
Artemisia pedatifida (birdfoot sage)
Atriplex spp. (saltbush)
Atriplex confertifolia (shadscale)
Atriplex nuttallii (nuttall saltbush)
Chrysothamnus spp. (rabbitbrush)
Chrysothamnus nauseosus (rubber rabbitbrush, big rabbitbrush)
Distichlis stricta (desert saltgrass)
Elymus spp. (ryegrass)
Oryzopsis hymenoides (Indian ricegrass)
Sarcobatus vermiculatus (greasewood)
Sitanion hystrix (bottlebrush squirreltail)
Sporobolus airoides (alkali sacaton, hairgrass dropseed)
Suaeda spp. (sea blite, seep weed)

(P/Q) Sagebrush Community - P (Big/Tall sagebrush) - Q (Little/Low Sagebrush)

This is the climatic climax of desert areas where the annual precipitation is usually greater than 7 inches. It occupies the broad valleys and lower foothills, forming a distinct zone.

Sagebrush communities extend to nearly 10,000 feet in many areas. Such high elevation communities are not the typical desert or desert-steppe communities.

Steep rocky slopes and areas with shallow soils are commonly dominated by low sagebrush (*Artemisia arbuscula* var. *arbuscula*) or black sagebrush (*Artemisia arbuscula* var. *nova*).

The tall sagebrush communities are best developed on deep, permeable, salt-free soils of well-drained valleys and bases of mountain ranges, especially on the alluvial fans. The aspect of the typical sagebrush community is fairly dense to open vegetation with relatively large (2-6 feet high) non-spiny shrubs, and with perennial and annual grasses and forbs. The ground cover of sagebrush is from 15 to 40 percent.

Some of the important shrubs in this zone are:

Artemisia pedatifida (birdfoot sage)
Artemisia frigida
Artemisia arbuscula (low sagebrush)
Artemisia tridentata (big sagebrush)
Chrysothamnus nauseosus (big rabbitbrush, rubber rabbitbrush)
Chrysothamnus viscidiflorus (rabbitbrush)
Eurotia lanata (winterfat)
Grayia spinosa (hopsage)
Leptodactylon pungens (prickly phlox, prickly gilia)
Purshia tridentata (bitterbrush, antelope brush)
Ribes velutinum (gooseberry)
Symphoricarpos spp. (snowberry)
Tetradymia spp. (horsebrush)

Perennial grasses and forbs:

Agropyron spicatum (bluebunch wheatgrass)
Poa sandbergii (sandberg bluegrass)
Festuca idahoensis (bluebunch fescue)
Agropyron smithii (western wheatgrass)

Often co-dominants with sagebrush

Agoseris spp. (mountain dandelion, false dandelion)
Allium acuminatum (wild onion, tapertip onion)
Aristida longiseta (red 3 awn)
Astragalus spp. (milkvetch)
Balsamorhiza sagittata (arrowleaf balsamroot)
Calochortus nuttallii (sego lily)
Castilleja chromosa (Indian paintbrush)
Delphinium spp. (larkspur)

Elymus cinereus (wild rye)
Eriogonum spp. (wild buckwheat)
Koeleria cristata (junegrass)
Lomatium spp. (desert parsley, biscuit root)
Lupinus sericeus (silky lupine)
Oryzopsis hymenoides (Indian ricegrass)
Phlox hoodii (Hood's phlox)
Phlox longifolia (longleaf phlox)
Poa fendleriana (muttongrass)
Sporobolus airoides (alkali sacaton)
Stipa comata (needleandthread grass)
Wyethia amplexicaulis (mules-ears)

Annuals:

Collinsia parviflora (blue-eyed Mary)
Eriogonum spp. (wild buckwheat)
Festuca octaflora (six-week's fescue)
Mimulus spp. (monkey flower)
Phacelia adenophora (phacelia)

Weeds found in disturbed habitats throughout the sagebrush zone:

Amaranthus retroflexus (pigweed, redroot)
Apocynum cannabinum (Indian hemp, dogbane)
Bromus rubens (foxtail)
Bromus tectorum (cheatgrass, downy chess)
Chenopodium album (goosefoot)
Convolvulus arvensis (field bindweed)
Cuscuta spp. (dodder)
Descurainia sophia (tansy mustard, flixweed)
Helianthus annuus (sunflower)
Lactuca serriola (wild lettuce)
Lepidium perfoliatum (clasping peppergrass)
Mentzelia albicaulis (whitestem stickleaf, blazing star)
Polygonum aviculare (prostrate knotweed)
Salsola kali (Russian thistle)
Sisymbrium altissimum (Jim Hill mustard, tumbling hedge mustard)
Taraxacum officinale (common dandelion)
Verbascum thapsus (great mullein, flannel mullein)

Some of the bunchgrasses are abundant enough that the prevailing vegetation is a sagebrush-grass or sagebrush-steppe community. The reason sagebrush tends to dominate some areas and bunchgrass others may be differences in the climate. A significant factor may be the time of precipitation. If it comes mostly in the winter the climax may be sagebrush and if it comes mostly in the summer it may be sagebrush-grass.

(R) Barren

The barren community type is primarily intended for those areas where insufficient vegetation exists on-site to be able to assign it to any of the other community types. Barren areas are those in which vegetative cover is sparse or nonexistent and can typically be found in badlands (with dense clay or clayey soils), scree (with very shallow or no soil development), and cliffs, rock outcrops, and boulderfields (primarily areas of bare rock and rock rubble). Barren areas can be found in various topographic positions and elevations.

(S) Marsh/Swamp

Marshes, swamps, and bogs are classified as wetlands. These lands are where water-saturated soil is the dominant factor determining the types of plants living on the surface. Wetlands are distinguished from riparian areas by the lack of primary association with a natural watercourse. Marshy and swampy areas surrounding lakes or ponds are generally placed in this category. marshes and swamps in Wyoming are generally less than 20 acres in size, lack active wave-formed or bedrock shoreline features, and have a water depth in the deepest part of the basin less than 2m at low water. Marshes and swamps have at least a 30 percent areal vegetation cover.

(T) Lake/Reservoir

The lake/reservoir code should be used for those locations where the immediate area is covered by water most of the year and where limited vegetation (or no vegetation) has developed. An example of a situation where this may occur would be where an archeological site is exposed on the lake bed after lake waters recede.

(U) Agricultural/Developed/Seedings

This category should be used for any area in which the vegetation has been altered and utilized on a continuing basis by direct human action. This would include cropland, cultivated fields, human habitations, urban/industrial development, and waste areas. Areas that have been abandoned and (at least partially) reclaimed by native vegetation would not generally fit in this category.

(V) Blackbrush Community

The blackbrush community is more or less transitional between the creosote bush and shadscale communities. Because it may occur in several zones we have here listed it separately.

Blackbrush grows on non-saline, often sandy soils, where the rainfall is usually below six inches. The community appears as dense

to open stands of evergreen shrubs, often interspaced with galleta grass (*Hillaria*). Its best development is in southeastern Utah at low altitudes along the Colorado and lower Green Rivers. In southern Nevada (Beatley 1969) this community lies altitudinally between the creosote bush and the sagebrush communities (commonly 4500-5000 ft.) and latitudinally between the creosote bush (Mojave Desert) and shadscale (Great Basin) communities.

Species commonly associated are:

Coleogyne ramosissima (blackbrush)
Artemisia filifolia (sandsage)
Artemisia parryi
Artemisia tridentata (big sagebrush)
Atriplex confertifolia (shadscale)
Brickellia oblongifolia var. *linifolia* (bricklebush)
Dalea fremontii (prairie clover)
Encelia frutescens (encelia)
Ephedra spp. (Mormon tea)
Eriogonum fasciculatum var. *polifolium* (California buckwheat)
Gutierrezia microcephala (snakeweed)
Haplopappus linearifolius (narrowleaf goldenweed)
Hilaria jamesii (Galleta grass)
Opuntia ramosissima and other spp. (prickley pear cacti)
Yucca baccata var. *vespertina* (datil yucca)
Yucca brevifolia (Joshua tree)

(W) Mountain Brush

On the lower slopes of the mountains there is often a zone of shrubs and small trees. In some places, particularly in limestone areas, this consists mainly of mountain mahogany (*Cercocarpus montanus* in eastern Wyoming and *C. ledifolius* to the west), while big sagebrush (*Artemisia tridentata*) is a characteristic and often dominant element where there is good soil development and adequate moisture from snow accumulation in the winter. Juniper (*Juniperus scopulorum* in eastern Wyoming and *J. osteosperma* in central and western Wyoming) may occur as scattered small trees or shrubs along with the preceding species, but it often forms an extensive woodland. In valleys, along major streams, a streamside forest, or sometimes only scattered trees, of narrowleaf cottonwood (*Populus angustifolia*) may be found, as well as shrubs such as willows (*Salix* spp.), roses (*Rosa* spp.), and dogwood (*Cornus stolonifera*). A common, conspicuous, tall grass of these sites is wild ryegrass(*Elymus cinereus*).

Common taxa are:

Amelanchier spp. (serviceberry)
Artemisia tridentata (big sagebrush)
Cercocarpus ledifolius (curlleaf mountain mahogany)
Cercocarpus montanus (mountain mahogany)
Juniperus osteosperma (juniper)

Juniperus scopulorum (juniper)
Prunus virginana (chokecherry)
Purshia tridentata (bitterbrush, antelope brush)
Symphoricarpos spp. (snowberry)

(X) Prairie

The extensive Laramie Plains and similar grasslands of the interior of Wyoming are of a somewhat different character than the eastern plains, being shortgrass plains. Dominant grasses here are blue grama (*Bouteloua gracilis*), several species of bluegrass (*Poa* spp.), junegrass (*Koeleria cristata*), needlegrass (*Stipa* spp.), and several species of wheatgrass. *

(Y) Creosote Bush Community (Warm desert shrub)

Larrea tridentata, the creosote bush, is the dominant shrub on the broad alluvial fans (bajadas) and flats of southern Nevada where some underground water is available.

Some of the associated shrubs are:

Larrea tridentata (creosote bush)
Acamptopappus shockleyi (goldenhead)
Ambrosia (Franseris) dumosa (bur sage)
Atriplex confertifolia (saltbush)
Dalea fremontii (indigo bush)
Encelia farinosa (encelia)
Eurotia lanata (winterfat)
Grayia spinosa (hopsage)
Krameria parvifolia (ratany)
Lycium andersonii (Anderson wolfberry)
Lycium sockleyi (wolfberry)
Opuntia spp. (prickley pear cacti)
Yucca shidigera

Found in Upper limits of Creosote Bush Zone:

Yucca brevifolia (Joshua tree)
Coleogyne ramoisissima (blackbrush)

Of six different *Larrea* communities the most common one in the high Mojave Desert (Lower Sonoran) is the *Larrea-Lycium-Grayia* (creosote bush-wolfberry-hopsage) association. In other parts of the Mojave Desert the typical association is *Larrea-Ambrosia* (creosote bush-bur sage). The general appearance is a mixture of somewhat evenly spaced medium tall and dwarf shrubs. Higher on the alluvial fans, toward the upper limits of the Zone, *Yucca brevifolia* (Joshua tree) forms open groves. This association extends up into the Shadscale and Sagebrush zones. Also coming in at these upper limits of the Creosote Bush Zone is *Coleogyne ramosissima* (blackbrush).

465 - National Register Criteria

The criteria are the National Register's standards for evaluating the significance of properties. The criteria are designed to guide the states, federal agencies, the Secretary of the Interior and others in evaluating potential entries (other than areas of the National Park System and National Historic Landmarks) for the National Register.

"The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguish-able entity whose component may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important in prehistory or history."

Briefly, what the above means, is that there are two factors to consider when evaluating a property (identified as a site, district, object, building, or structure). These are its integrity and one or more of the four criteria. For the field archeologist dealing with archeological properties, Criterion D is the most relevant to apply. The ways in which Criterion D may be applied have been examined by the National Park Service who have since developed Criterion Guidelines (in addition to integrity, properties being assessed must qualify for one or more of the guideline standards to be of National Register significance). When applying Criterion D Guidelines, it is important (according to NR officials) to keep in mind, (1) does the property contain information that will contribute to current knowledge of history or prehistory and (2)is the information important.

CRITERION D GUIDELINE

1. It must be possible to verify the human origin, modification,and/or utilization of the property.

2. A general knowledge of cultural affiliation and/or period of use should be identifiable.

3. Properties (defined above) must be or must have been the principle source of important data.

4. Excavated sites and other properties that no longer retain additional research potential are assessed as historic sites and are eligible under Criterion A.

5. Partially excavated or otherwise disturbed sites (i.e. vandalized, eroded, recreational) should be considered for their potential to yield additional information from their remaining portions.

6a.Important information relates to: (1) research designs addressing current data gaps, defensible new models or theories; (2) priority areas identified under a state or federal agency management plan, and; (3) the correction of misapprehensions in current understanding of history and prehistory.

6b. Once the possibility of yielding important information is established, it is necessary to explicitly demonstrate the connection between the important information and a specific property.

6c. In support of the assertation that a property has the necessary data to provide the important information, the property should be investigated with techniques sufficient to establish the presence of relevant data categories.

7. Integrity of a property is not necessarily visual. It is more important that significant data the property contains remains in a sufficiently intact condition to yield the expected important information if the appropriate study techniques are employed to obtain the data.

For detailed information, consult:
National Park Service
1982 "How to apply the National Register criteria for evaluation."
Department of the Interior, Washington D.C.

470 - NAILS

470.1 - IMACS Classification: (NH) Nails - hand forged
(NC) Nails - cut (square)
(NW) Nails - wire/round

These divisions are based upon manufacturing techniques.

470.2 - Classification Descriptions:

1) Hand forged (wrought) nails: (technique of manufacture) - "The crudest kind of wrought nail was simply a piece of soft metal (eg. iron) hammered into nail form. The earliest nails were likely made this way. By the 18th century wrought nails were fashioned from metal plates rolled in rolling mills to the required thickness and then split by splitting-rollers into nail-rods or split-rods of various sizes, depending on the size and type of nail to be made. These rectangular rods of soft, malleable iron were then taken by nailers and drawn to a point by hammering. Heads were the untapered portion of the shank spread by clamping the shank in a vise and striking it with a hammer (Mercer 1924)" (Fontana and Greenleaf 1962).

2) Square cut nails: (technique of manufacture) - "Cut nails were made from rectangular strips of iron plate and tapered to a point by a single cut across the plate. The thickness and height of the plate determined the thickness and length of the nail, while the breadth of the nail at its head and point depended on the amount of taper applied in cutting and the strength of the blow used in forming the head" (Fontana and Greenlead 1962).

Attributes of hand forged nails versus square cut nails: "Regardless of size, wrought nails (hand forged nails) can readily be distinguished from square cut nails on the basis of the following features (Mercer 1924):

1) Wrought nails taper on all four sides of the shank toward the point rather than on two opposite sides as in the case of square cut nails.

2) Wrought nails vary in thickness throughout the length of the shank because of their having been hand forged; square cut nails exhibit uniform thickness because of their having been cut from a plate of uniform thickness.

3) Striations, minute parallel shear marks resulting from the shear of the cutting blade used to make square cut nails, are absent on shanks of wrought nails" (Fontana and Greenleaf 1962).

3) Wire or round nails: (technique of manufacture - a discussion of the methods of manufacturing wire nails is beyond the scope of this description -- see Scientific American (Anonymous 1903) for a discussion of manufacturing techniques.)

Attributes of wire or round nails: Wire nails are the common variety found today in this country.

470.3 - Chronology of Types:

For the purpose of dating nails Fontana and Greenleaf (1962:54-55) presents the following survey:

Pre - 1800: Nails were handmade, wrought nails, universally characterized by uneven rectangular shanks that taper on all four sides to a point. For certain purposes wrought nails continued in use until as late as 1850, and in isolated instances may have been made in the United States when square cut or wire nails were not available.

1790-1810: This period is characterized by machine-cut nails, the nail plate being reversed under alternate blows of the cutter. A few stamp-headed nails occur, but most are headed by a single hand-driven hammer blow. Angle-headed or L-headed nails made from headless nails also appear and continue in use until after the 1850s for use in floors and clapboards.

1810-1825: Machines are invented to make cut nails that obviate the necessity of having to turn the nail plate. Until 1825 such nails continued largely to be headed simply by being struck with a hammer.

1825-1830: Cutting of nails continues as immediately above, but water-powered machines are developed that head them automatically. The heads, however, are rather thin and lopsided.

Circa 1830-Circa 1855: Wire nails are invented in France (hence 'French nails') that are ground to a point and headed by hand. The first such nails are made in the United States by William Hassall (or Hersel) of New York City. They are rare in the United States during this period.

1830-Circa 1890: Cut nails are produced in machines that cut and head them uniformly. Heads are less thin, more uniform, and comparatively square. They are extra heavy on large nails. Cut nails in the United States during this period outnumber all other kinds with respect to both number and variety.

Circa 1855-present: Machines are invented in France to make complete wire nails automatically. A few are exported to the United States, soon to be replaced by machines of American manufacture. It is about 1890, however, before wire nails outnumber cut nails. Wirenails today are the common variety in this country.

Circa 1870-present: Cut nails are annealed to prevent their rupturing when clinched.

Circa 1890-present: Cut nails continue to be manufactured for special purposes, such as securing wood to cement, concrete, or plaster, until about 1950, when they were replaced by cement-coated nails. But, cut nails were still commonly found in sub-flooring for

hardwood floors. It was also probably early in this period that large cut nails were pretapered in rolling mills, the nails then being cut with parallel rather than diagonally opposing strokes of the knife.

Rocky Mountain Area Nail Chronology and Notes (from Buckles et al. 1978:438-440).

Prior to 1790, nails were hand forged. Invented about this date, machine cut square nails were widely in use by 1830, although hand forged continued to be used, particularly in frontier areas. Although introduced as importations of small nails in the 1850s, wire nails did not dominate the market until the 1890s. A general rule is that the larger the percentage of square cut nails, the older the site. Machine cut square nails are still manufactured for limited usage.

Many sites in Colorado were occupied in the late 19th Century during the transition period from cut to wire nails. Inferences from production figures of cut and wire nails cited by Clark (1949, Vol II:351-355 and Vol. III:125-127) indicates the rapidity with which wire nails replaced cut nails in availability. The first wire nail made in the United States was in 1873 but large scale production did not begin until the 1880s. By 1884 six manufacturer's were producing wire nails, although in 1886 'cut nails' were dominant. By the 1890s wire nail production far exceeded cut nail production as the following figures, cited by Clark (1949, Vol. III:125-127), indicate:

Nail Production in the United States

Year	Nail Type	Amounts
1886	Cut Nails	8,161,000 kegs
Wire Nails	No figures	
1894	Cut Nails	2,425,000kegs
Wire Nails	5,682,000 kegs	
1900	Cut Nails	1,573,000kegs
Wire Nails	7,234,000 kegs	

It can be postulated that since nail production averaged 8,000,000 kegs a year for the years cited, the great majority of nails available in 1886 were cut nails. A 'Rubicon' was possibly crossed about 1890 when wire nails were in the majority. This allows tentative dating for sites as follows:

1886 --- cut nails
1890 --- 50% cut, 50% wire nails
1895 --- 25% cut, 75% wire nails
Post-1895 --- greater than 75% wire nails

470.4 - Additional Notes Pertinent for Recording Nails (esp. as to function): (from Buckles et al. 1978:403-404)

Three functional classes of construction nails are defined which we believe to have some validity. Small construction nails are defined as 2d-5d and are used in the final stages of carpentry. Nails from 6d-16d are called medium construction and are used for most purposes. Large construction nails are those which are 20d or larger and are used for framing a house, fence construction, or similar activities.

Classifications of nails are according to the pennyweight system which is still in use today. This system of measurement is applied to both square cut and wire nails. It is recorded as 'd'.

Pennyweights of nails:

2d to 10 d are based upon 1/4" increments beginning at 1", (i.e., 1"=2d, 1-1/4"=3d, etc. up to 3"=10 d)

1"	= 2d	3"	= 10d
1 1/4"	= 3d	3-1/4"	= 12d
1 1/2"	= 4d	3-1/2"	= 16d
1 3/4"	= 5d	4"	= 20d
2"	= 6d	4-1/2"	= 30d
2 1/4"	= 7d	5"	= 40d
2 1/2"	= 8d	5-1/2"	= 50d
2 3/4"	= 9d	6"	= 60d

470 - NAIL STYLE BREAKDOWN

Figure 11. a-l, square cut nails, 1:1 scale; a, 8 d. finishing; b. 1 1/4" barrel: c, 3 d. fine blued; d, 7/8" tobacco; c. 12 oz. Hungarian shoc; f, 6/8" Hungarian shoc; g, 10 d. 3 " clinch; h. 40 d. common cut; i. 9 d. common cut; j, 8 d. fencing; k, 8 d. casing; l, 8 d. brad, m-r, no scale.. m. wrought iron nail, about 1800; n. cut nail with wrought head, about 1800-1825; o. cut nail with crudely-stamped head, about 1825-1830; p. cut nail with "L" head, about 1800, 1850; q. cross section of cut nail shank, about 1790-1810; and r. cross section of cut nail shank, about 1810-present.

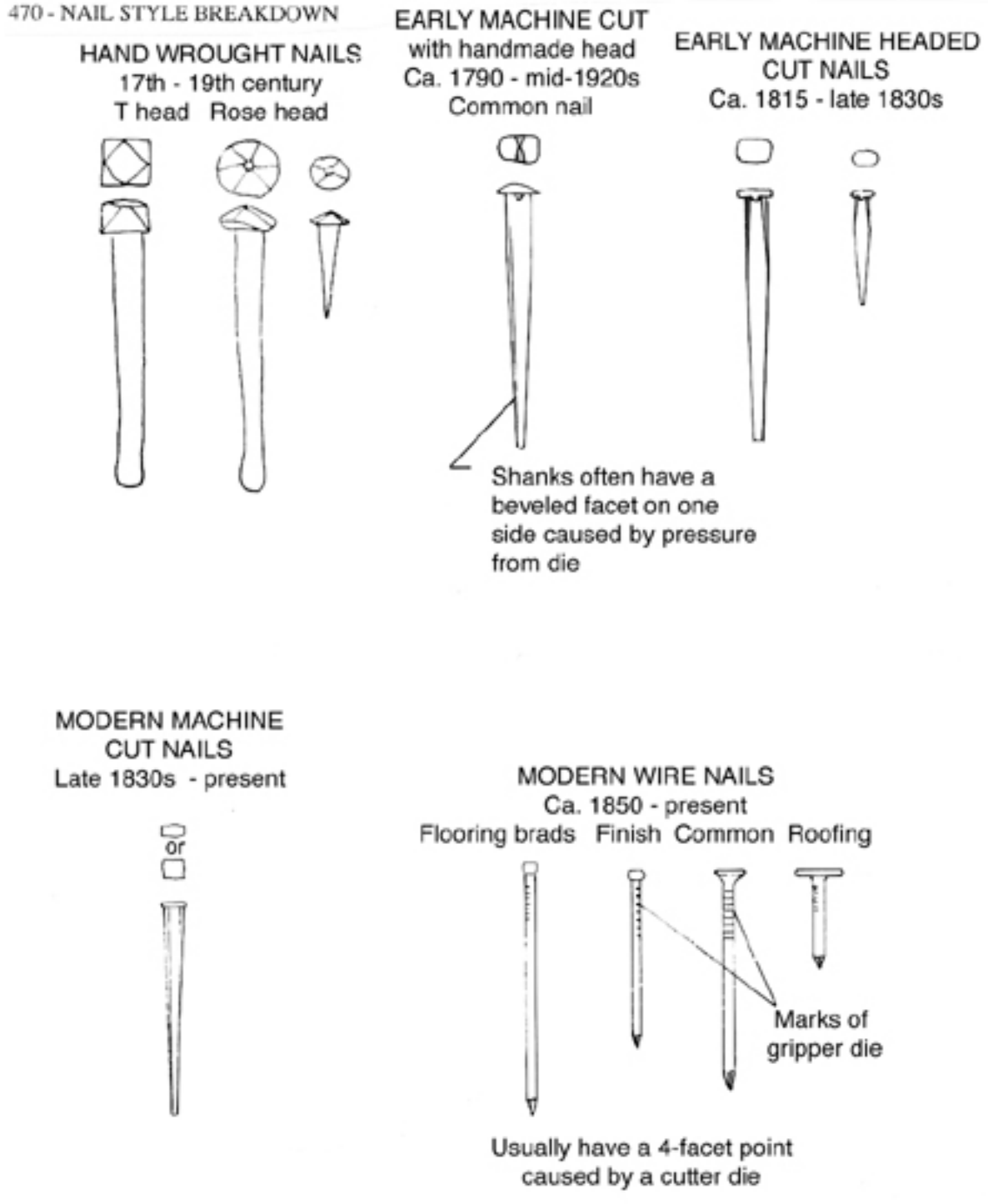


Figure 11. a-l, square cut nails, 1:1 scale; a, 8 d. finishing; b. 1 1/4" barrel: c, 3 d. fine blued; d, 7/8" tobacco; e. 12 oz. Hungarian shoe; f, 6/8" Hungarian shoe; g, 10 d. 3 " clinch; h. 40 d. common cut; i. 9 d. common cut; j, 8 d. fencing; k, 8 d. casing; l, 8 d. brad, m-r, no scale.. m. wrought iron nail, about 1800; n. cut nail with wrought head, about 1800-1825; o. cut nail with crudely-stamped head, about 1825-1830; p. cut nail with "L" head, about 1800, 1850; q. cross section of cut nail shank, about 1790-1810; and r. cross section of cut nail shank, about 1810-present.

471 - TIN CANS

471.1 - IMACS Classification:

(TD) Tin Cans - Hole-in-top
(TC) Tin Cans - Sanitary/Open Top

471.2 - Description of Classification and Attributes of Types:

1) Tin Cans - Hole-in-Top or Hole-and-Cap: "The cans of this era were manufactured completely by hand. To make the body, a piece of tinplate was bent into shape on a roller and the overlapping edges were soldered together. Two round disks were cut for the ends, their edges were bent down, or flanged, and they were soldered to the body. The top could be soldered on after the can was filled, but more common was the hole-in-top can. A top with a circular hole about an inch in diameter was soldered on before the can was filled, food was pushed through the hole, then a cap with a small vent hole was soldered over the opening. During processing, when a sufficient amount of steam had escaped, the vent hole was closed with a drop of solder. The soldered hole-in-top can changed little in style through the 19th century, but even before the Civil War its manufacture was partially mechanized" (Busch 1981:95).

"A primary and long lasting feature of the early canning industry was the introduction of the hole-in-top can. Using this method, the can was filled and then covered with a lid having a hole in the center. After boiling, the can was closed with a drop of solder (Bitting 1912:9). Hole-in-top cans were, initially, completely handmade by cutting and soldering of the tops and seams. In time, machine cutting and soldering were introduced. Soldering was replaced by crimping and hooks, although solder was also used as a reinforcement of these seals on some cans" (Buckles et al. 1978:410). Numerous refinements were made in the can industry prior to replacement of the hole-in-top by sanitary cans. These refinements can be classified as transition cans but are encoded as hole-in-top cans.

2) Tin Cans - Sanitary (open-top): "The most radical change in can history was the switch from the hole-in-top can to the sanitary can. The sanitary or open-top can was initially developed in Europe, where can ends were attached to the body by hand crimping the edges together, with a rubber gasket in between to make the seam airtight. In 1896, in the United States, Charles Ams patented a sealing compound of rubber and gum to replace the rubber gasket. By 1897, the Ams Machine Company brought out a machine that applied this compound to can ends automatically and crimped the ends to the body in a double seam, an improvement over the single seam used in Europe (May 1938:438-439; Collins 1924:36-38). With the crimped, or locked, double end seam, locked side seams replaced lapped side seams. For a lapped seam, solder was applied to the body edges which were lapped over each other while hot. The lapped side-seam fit the flanged, soldered-on top better than the locked side-seam, which was not perfected until the 1900s. For a locked side-seam the edges are crimped together and soldered on the outside only, leaving no

Tin Can Types

See ILLUSTRATIONS section.

external ridge (Fontana et al. 1962:70; Collins 1924:35). The new can was considered more sanitary because it was soldered on the outside only. Because the top was crimped on after filling, it could hold larger pieces of food than the hole-in-top can (National Canners Association 1963:8)" (Busch 1981:97-98).

471.3 - Chronology of Types:

1) Tin Can Chronology: (from Busch 1981:103)

1819 - Beginning of commercial canning in America (fruit & vegetables)

1825 - Thomas Kensett granted U.S. patent for canning food in tin

1856 - Gail Borden granted patent for canned condensed milk

1894 - Ams machine company begins manufacturing locked, double-seamed can

1901 - Formation of American Can Company

1935 - Introduction of the beer can

1945 - First aerosol cans marketed

1959 - First all-aluminum beer can

1962 - Introduction of the beverage can pull-tab

1965 - Introduction of the tin-free steel beverage can

2) Tin Can Chronology: (from Berge 1980:261-262)

1850s- Kerosene patented

1865 - Kerosene canned

1872 - Large-scale meat canning began in Chicago

1875 - Sardines packed

1892 - First tobacco can

1906 - Modern paint can came into use

1909 - Tuna canning began in California

1910 - Flat-sided, hinge-lidded tobacco can came into use

1917 - Ernst Moeller, Bayer Company, developed the idea of a pocket-sized aspirin box

1917 - Key-opening collar-can for coffee introduced

1921 - Canned citrus juice first shipped from Florida

1922 - First canned dog food developed by P.H. Chopped

1926 - Canned ham was introduced

1933 - Quart can of motor oil used

1953 - Canned soft drinks became popular

3) Tin Can Chronology: (from Buckles at al. 1978:440-441)

1820s - The canning industry was introduced into the United States. At this time cans were made entirely by hand. Each part was cut and a heavy beading of solder was applied to both top and bottom as well as to seams.

1849 - The first die for making tops and bottoms of cans was introduced (Stevenson 1914:92). After this time, numerous machines were invented for the cutting and soldering of cans. Later, machines for crimping came into use. From this time onward cultural lag in manufacturing techniques is quite evident within this industry, stemming from secrecy surrounding advancements, labor difficulties, mechanization, expenses of new technology and others. Thus, we find old methods in use for the manufacture of cans long after faster and more efficient processes were invented. Dates of invention of patents are helpful, however, in establishing initial dates for can types.

mid 1880s - New machines for the making and packing of cans were being developed. Crimping, first successfully introduced in 1869, was initially used in combination with soldering. This method did not become a major part of can manufacturing until the 1880s (Stevenson In Judge 1914:92-93).

1894 - The first patent for the "sanitary" can was issued. This can, totally crimped and without the use of the hole-in-top, continued in experimental stages until 1903 when great strides were made in its development and acceptance by the industry (Cobb In Judge 1914:95-96).

1922 - The sanitary can was in general use (Fontana and Greenleaf 1962:73). Even so, hole-in-top cans are still in use to package condensed milk.

4) Tin Can Chronology (Jim Rock, 1990)

1810- Peter Durand was granted a patent for a tin-plated food container by King George III of England.

1818- Peter Durand introduced the tin container in America.

1819- Fish, oysters, fruits, meats and vegetables were being canned in New York by Thomas Kensett, Sr. and Ezra Daggett.

1830s- Huntley and Palmer of Reading, England were selling their cakes and biscuits in decorated tin boxes.

Mid-1840s - The hole-in-cap can became common.

1847- Allen Taylor patented a machine for stamping cylindrical can ends.

1849- Henry Evans, Jr. improved Taylor's patent with the "Pendulum": press for making can ends.

1850- Louis Pasteur discovered that bacteria caused food spoilage. By heating a "closed" can these
1860 microscopic, single-cell plants could be killed. This could be done in a hole-in-cap can.

By the Mid-1850s small seamless cans were being manufactured.

1856 Gail Borden began canning condensed milk in America. To get the contents out of this can you must remove all or most of the can end.

1856 Henry Bessmer of England discovered, as did William Kelley of America in 1857, the process for converting cast iron into steel.

1859 A patent was granted for lock side seams for cans in America.

1861- The U.S. Government, "The North", purchased quantities of Borden's condensed milk for military
1865 use. This proved to the public that canned products were safe and nutritious.

1871- The first American tinplate works was established.

1870s- A process for one-color lithography on tin plate was developed.

Hinged lid tins were on the market.

1875- Arthur A. Libby and William J. Wilson of Chicago developed a tapered meat tin for packing their products.

Late
1870s- Daniel, Joseph and Guy Somers of New York developed their lithography techniques.

Ginna and Co. of Brooklyn, New York, began producing fine artistic lithographed tins.

Howe developed the "Joker" and "Little Joker" systems that automatically attached and soldered can ends.

The English required their can manufacturers to stop soldering on inside side seams of cans. In America, this practice was discontinued at a later time.

1880s- Chromolithographed tins were introduced. These tins were lithographed by using a series of color plates. Multicolored tins were now on the market.

1885- Evaporated milk was first canned in the United States. These cans are opened by punching two holes on opposite sides of the can lid or top.

1888- Max Ams of Max Ams Machine Co. of New York developed a double side seam and gasket for cylindrical cans. This led to the "Sanitary Can".

1891- The McKinley Tariff Act greatly reduced the flow of tinplate from Europe to America.

1892- Hasker and Marcuse Manufacturing Co. was founded in Richmond, Virginia.

The flat top tobacco can was introduced on the American market.

1895- The tapered meat can was improved by the Norton Brothers of Chicago, when they added a scored key wind strip to the large end of the can.

1897- The log cabin shaped can was patented.

1898- Edwin Norton patented a vacuum pack tin.

1900- Tindeco (Tin Decorating Co.) of Baltimore was founded. By the 1920s it was the leader in lithographed tin.

After 1900 the vent hole filler can was introduced for evaporated milk.

1901- American Can Co. (AC Co.) was formed. By the 'teens they were using Canco as their logo.

1901- Hecking Can Co. began operations in Cincinnati, Ohio. Their logo was an H inside a circle.

1903- Hills Brothers of San Francisco vacuum packed the first coffee for commercial use in "squat" on pound cans.

1904- The Sanitary Can Co. was founded. They produced double-seamed open top cans.

Continental Can Co. (C.C.Co) was founded.

1906- Plus or minus two years, the upright flat tobacco can was marketed.

1908- American Can Co. absorbed the four sanitary can companies.

1911- Most California can manufacturers were producing sanitary cans.

1921- Enamel lining of zinc oxide was first used to coat the inside of cans. This coating prevented discoloration of vegetables and other reactions with the metal can.

1935- The invention of C-enamel allowed the flat top and bottom beer can to be introduced. Later that year the cone-top beer can was also introduced. The "Church Key" was invented to open the flat top beer can. This opener makes a triangular shaped hole in the can's top. The cone-top can allowed beer bottlers to retain their old bottling equipment.

WWII It appears that the hole-in-cap was taken out of production.

Late
1950s- A soft aluminum top was added to the metal flat top beer can.

1957- All aluminum cans were first produced.

1963- The aluminum tear-top can and the D & I (drawn and ironed) aluminum can were introduced.

1972- The State of Oregon required beer can tabs to remain with the can.

1980- 3M developed a peel scotch tab for drink cans.

471.4 - Additional Notes Pertinent for Recording Tin Cans:

1) Types of Can Openings: - from Buckles et al. 1978:412-415)

The manner of opening a can reflects, to a degree, what was contained within the can. The types of openings which are recognized should be recorded as per the description/illustration below. In addition, the number of cans with different types of opening should be estimated.

Tin Can Openings

See ILLUSTRATIONS section.

There are other variants of can openings which can be used. These openings are useful for insights into can functions. Key opened, removable lids, paint lids and pry out lids, as an example, contained relatively non-perishable items such as tobacco, cocoa, and others. Each is traditionally associated with a particular product type. Key openings are associated with lard cans, potted meats, sea foods and others. A special type of hole-in-top can with an inside flap was used in the salmon canning industry (Bitting 1912:67-68). It is not an opening, but a variant of the hole-in-top can construction. Cans which have either puncture holes, spouts, or have been opened with a "church key" all probably contained liquids, thus requiring small openings to remove the contents. Cans cut completely around and X-Cut lids are indicative of fruit or vegetables which require larger holes for removal of the product.

2) Can Contents and Sizes: (from Buckles et al. 1978:416)

Another method of determining the possible contents of cans stems from traditional use of can sizes within the industry of canning. No set governing standards as to either can sizes or contents can be applied across the board due to the fact that the canning industry itself was not standardized.

Can sizes have been standardized in practice, to degrees, and can be classified by numbers or names used by grocers.

Number or Name	Height	Diameter	Contents
5 oz.	2-7/8"	2-1/8"	
6 oz.	3-1/2"	2-1/8"	
8 oz. regular	3"	2-11/16"	Fruits & fruit cocktail
8 oz. tall	3-1/4"	2-11/16"	
Picnic, Oysters	4"	2-11/16"	
No. 300	4-7/16"	3"	Tomato & pineapple juice
No. 300X	4-9/16"	3"	Tomato juice
No. 1 tall	4-11/16"	3-1/16"	Fruits, tomato juice, pineapple juice
No. 303	4-3/8"	3-3/16"	Tomato & pineapple juice
No. 2 flat	2-1/4"	3-7/16"	
No. 2 short	4"	3-7/16"	Peas, corn, string beans, fruits
No. 2	4-9/16"	3-7/16"	
No. 2 1/2	4-11/16"	4-1/16"	Fruits
No. 3	4-7/8"	4-1/4"	
No. 10	7"	6-3/16"	Fruits
Gallon	8-3/4"	6-3/16"	Limited extent for olives, fruits & vegetables
No. 1 square	3-1/2"	3 x 3-1/2"	
No. 2 1/2 square	6-1/4"	3 x 3-1/2"	

Condensed/Evaporated Milk Cans--Chronology for Dating Historical Sites (Don Simonis)

Type	Diameter	Height	Cap Diam.	End Seams	Side Seams	Dates
1	3.0	3 4/16	1 12/16	S	S	1875-1885
2	2 15/16	3 5/16	1 9/16	S	S	1885-1903
3	2 15/16	4 6/16	1 12/16	S	S	1885-1903
4	2 15/16	3 5/16, 4 6/16	1 4/16	C/S	C	1903-1908
5	2 8/16	2 8/16	1.0	C	C	1903-1914
6	2 15/16	4 6/16	1 1/16	C	C	1903-1914
7	1 15/16	4 6/16	12/16, 7/16	C	C	1908-1914
8	1 8/16	2 8/16	M	C	C	1915-1925
9	2 8/16	2 7/16	M	C	C	1920-1930
10	2 15/16	4 6/16	M	C	C	1915-1930
11	2 8/16	2 6/16	M	C	C	1917-1930
12	2 8/16	2 6/16	M	(4 rings embossed)	C	1931-1948
13	2 15/16	4 4/16	M	C	C	1917-1929
14	2 15/16	4.0	M	C	C	1917-1929
15	2 15/16	3 14/16	M	C	C	1917-1929
16	2 7/16	2 7/16	M	C	C	1931-1948
17	2 15/16	3 14/16	M	("Punch here" embossed)		1935-1945
18	2 7/16	2 8/16	M	C	C	1920-1931
19	2 15/16	3 14.5/16	M (if with raised rings then 1945-1950[?])	C	C	1950-present
20	2 8/16	2 5/16	M	C	C	1950-present

Types 1 and 2 condensed milk, so will be cut out, not punch holes, etc.

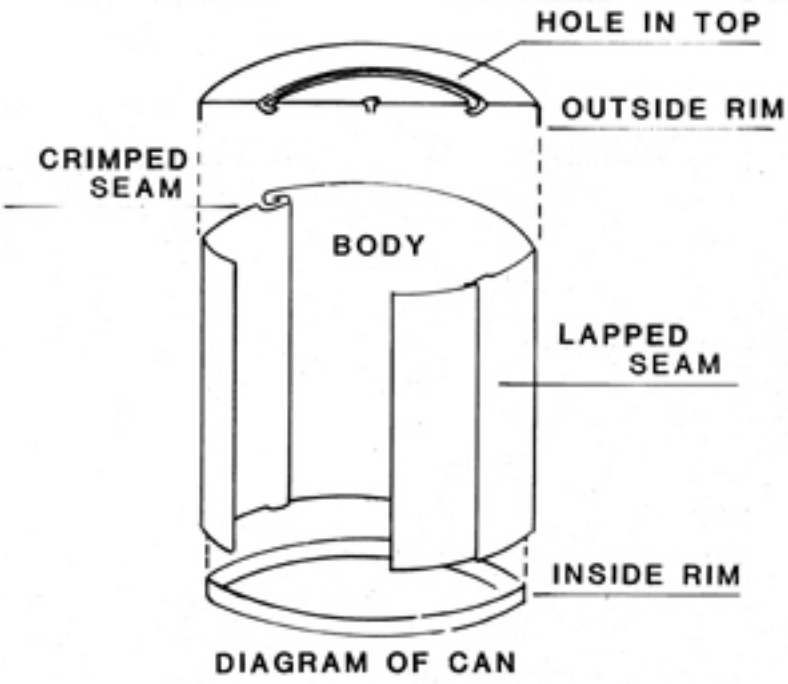
"N. YORK" until 1900, then "BORDEN"

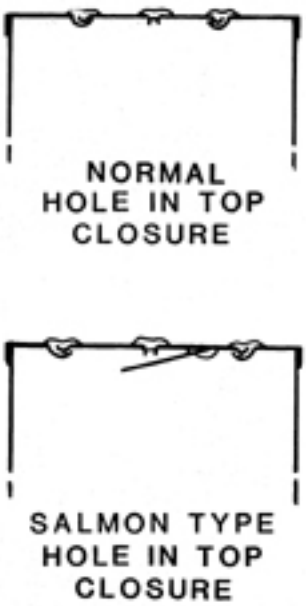
M- match stick filler solder on raised circle (post hole and cap); still used today in milk cans.

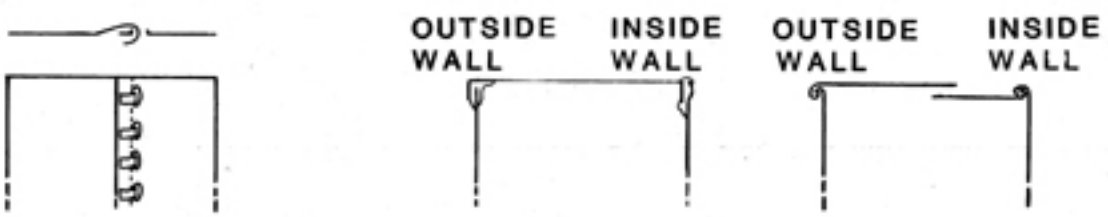
S- soldered seams used on early cans.

C- crimped seams on later cans.

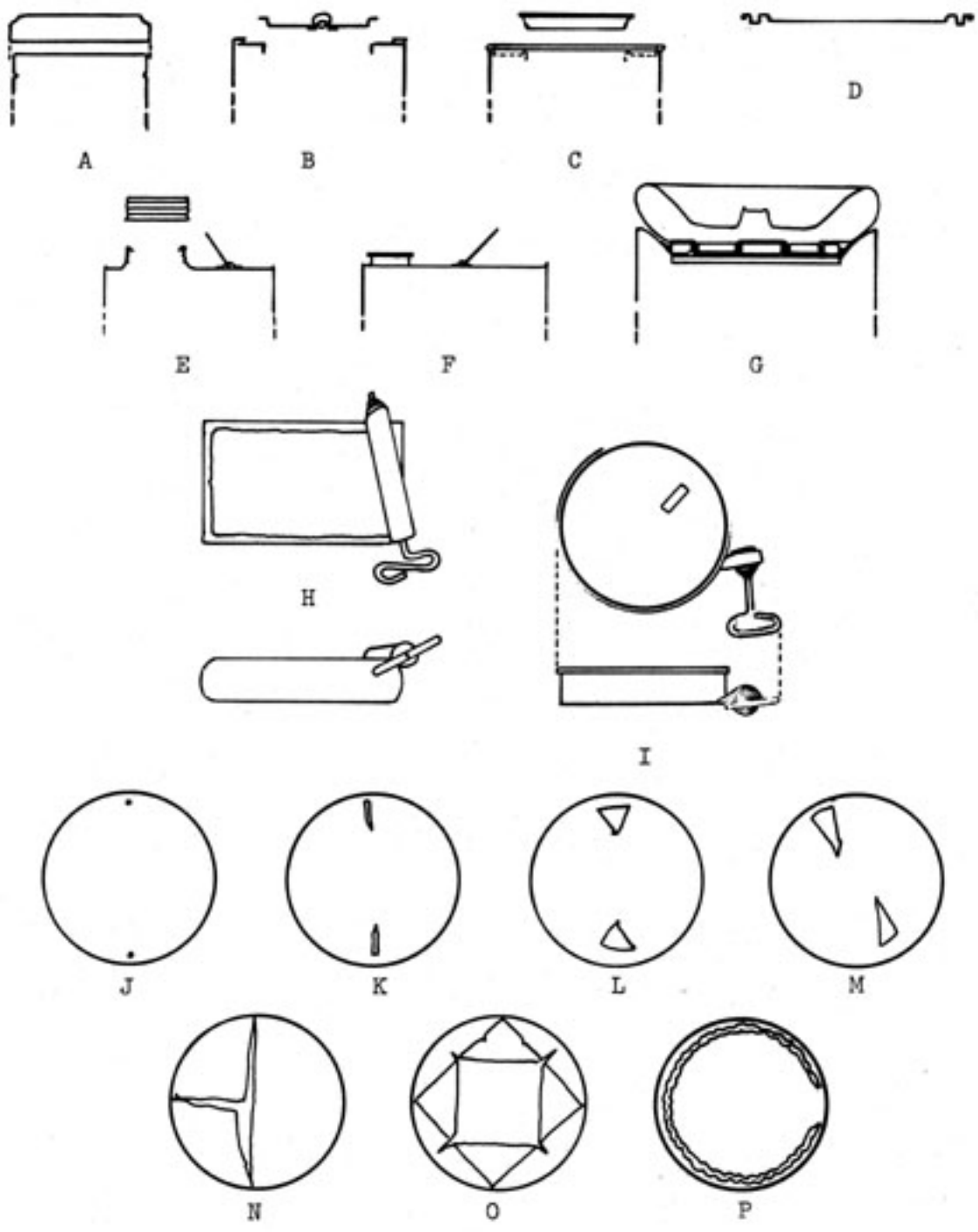
Tin Can Types







Tin Can Openings



A. Removable lid
B. Removable lip lid
C. Pry out lid
D. Paint can lid
E. Screw cap
F. Spout
G. Hinged lid
H. Key-opened, rectangular/square
I. Key-opened, round
J. Ice pick
K. Knife cut
L. Church key
M. Puncture and Pry
N. "T" cut(usually by knife)
O. "X" cut(usually by knife)
P. Cut completely around

472 - BOTTLES/GLASS

472.1 - IMACS Classification: See IMACS Users Guide for complete bottle and glass classification.

472.2 - Bottle Terminology:

The following definitions for bottle terminology are taken from Berge (1980:37-38). The definitions presented below are represented by the illustration on the following page.

The average bottle consists of six basic sections -- finish, neck, shoulder, body, insweep or heel, and base. The 'finish' is the top section of the bottle attached to the neck from which the bottle contents are obtained and to which a closure is applied to secure the bottle's contents from spoilage or spilling. The upper part of the finish to which a cap would seal itself is the 'sealing surface'. The diameter of the aperture opening is the 'bore'. Sometimes a ring of glass is placed around the neck at the base of the finish in order to secure the closure, usually on threaded closures, which are called a 'collar'. The collar, when present, is the basal portion of the finish. The 'neck' is generally an extension of the finish that connects the finish to the shoulder. The neck is usually the same general size and cylindrical shape as the finish. The part of the neck that connects the neck to the shoulder is termed the 'root of the neck'. The 'shoulder' is an extension between the neck and body which connects these sections to form the single unit. Often the body is wider than the neck, and the shoulder serves as a means of reducing the body diameter to the size of the neck and finish. The lower section of the body which attaches to the base is called an 'insweep'. The 'base' is under the section of the bottle on which the bottle rests when not in use. All the weight of the bottle may not rest on the entire surface of the base, if the base is not flat. Curved bases help to withstand internal pressure on the bottle, especially fermented or carbonated contents. If the base is convex, as in some soda pop bottle types, it is called a 'round bottom'. If the base is slightly concave, it is referred to as a 'push-up' (Glass Manufacturers' Federation n.d.:1). On wine bottles, the push-up is much deeper and is termed a 'kick-up'.

472.2A BOTTLE TERMINOLOGY ILLUSTRATION
(from Berge 1980:39)

472.2B BOTTLE NECK FINISHES
(from Fike 1987)

472.2C BOTTLE BASE PROFILES
(from Fike 1987)

472.3 Bottle Chronologies and Manufacturers Techniques:

1) Bottle Chronology: (from Berge 1980)

1700-1800: Typical bottles were the tall and squat bottles with kick-up bases, squat types with long necks, and late types with high kick-ups. Another common bottle type was the Dunmore.

1780-1840: The most common feature of bottles before 1820 is the crude blow-over finish formed by simply cutting the container free from the blow pipe--also called a 'sheared lip' (Kendrick 1966:28). Other popular bottles included the Ludlow, Chestnut flasks, and the swirled bottle.

1840-1860: With the glass industry in full bloom diversification began to take place and new inventions were produced to satisfy the demands of consumers.

The bottles of this period and earlier were formed by open molds in which only the body was formed. The neck and finish had to be shaped by hand. This type of mold leaves a seam on the bottle body which terminates on the shoulder or the low neck (Kendrick 1966:47). It was the practice of glassmakers to form finishes by applying a strip of glass around the sheared end of the neck. The manufacture of free-blown bottles died out around 1860, so that the seamless bottles of irregular shapes are seldom encountered after this date.

A common feature up to 1860 on ordinary utility items was pontil marks. This mark, found on the base of bottles, consisted of an area somewhat circular, rough and sharp where a glass rod had once been attached to maintain control during the hand-making of the finish.

Between 1850 and 1860, the pontil was gradually replaced by the snap-case. The rod was not physically attached to the bottle base, but rather a tong that snapped tight to the bottle heel was used; when removed it left no marks on the base. This left the base free for lettering or decoration (Kendrick 1966:29).

There was little concern over the color of glass until food began to be bottled. Then came the desire to see what was in the bottle, so glass had to be made lighter. Dark olive-green or black glass, common up to 1860, began to be replaced by clearer and lighter colored types of glass.

1860-1880: The bottles of this period were still produced by somewhat crude manufacturing techniques, but a change was beginning to take place. Colors were still some what unimportant, though they were more refined and lighter. Also, clear glass containers grew in importance around 1880. There may have been a refinement in finish

preparation, because mold seams of this period end just below the finish, an obvious indication that the finish was made separate from the body (Kendrick 1966:47).

An important characteristic of some bottles that first appeared in 1869 was that of embossing them with the names of contents, manufacturers, distributors, slogans, and messages. This practice nearly died out with the advent of automatic bottle machines (1903); paper labels were used extensively on bottles made from such machines (Kendrick 1966:71).

Beer bottles were found in the West only after 1873. As stated by Woodward (1959:126-127), pasteurization of beer is a prime requisite for the proper bottling of beer and since Pasteur's process did not come into active use in the brewing business until 1873, we can safely assume that no bottled beer was shipped to Ft. Union or any other place in the United States prior to that year.

1880-1900: The common mold of this period was the closed mold in which the entire bottle, except the upper section of the finish or lip, was mold-made. On these bottles, the seam ends at about the middle of the neck. The contours of the finish became more controlled and standardized, resulting in more uniformity of closures (Kendrick 1966:47-48).

In 1892, a semi-automatic process called 'press and blow' was invented, which was adaptable only to the production of wide-mouthed containers. In this method, the glass was pressed into the mold to form its mouth and lip first. Then a metal plunger was forced through the mouth and the air pressure was applied to blow the body of the vessel. This process was used for the production of fruit jars and also our early milk bottles. It was not adaptable to narrow-necked bottles because of the 'bottleneck'. The necks were too small to allow the use of the metal plunger. So our conventional screw-topped bottle did not become common until after 1924, when the glass industry standardized the thread (Kendrick 1966:51).

By 1896, the first of the new semi-automatic machines was in successful operation at the Atlas Glass Works, and in 1898 Ball Brothers installed a similar machine for the making of fruit jars (James 1956:19).

1900-1940: D. James (1956:17-18) divides this time period into three phases: 1) 1898 to 1906 - semi-automatic machinery for the making of wide-mouth ware exclusively; 2) 1905 to 1917 the Owens automatic machine for the making of all kinds of bottles, wide and narrow mouth, and semi-automatic machinery for the narrow mouth ware; and 3) 1917 onward - semi-automatic machinery made automatic by the feed and flow devices.

At the beginning of the 20th Century, a new phase of bottle manufacture commenced.

> Through the cooperation and financial backing of the Toledo Glass Works, the Owens machine was perfected in 1903. At first, the Owens machine made only heavy bottles, which were wanted in great number. In 1909, improvements allowed it to make small prescription bottles. By 1917, other completely automatic bottle making machines had been invented, and bottles were formed automatically throughout the civilized world.
>
> Characteristically, bottles formed by the Owens machine will have heavy bottoms, thick even walls, and the seams of the neck molds will not line up with the seams of their bodies.
>
> A distinguishing mark left by the Owens machine is a shallow wrinkle in the glass which forms a circle in the base of the bottles. The ring probably is off center and may complete its circle by extending up the sidewalls of the bottle.
>
> This "Owens ring" formed when the glass, which was sucked up into the lip mold, was cut off from the rest of the glass in the pot (Kendrick 1966:81).

Before 1917, the only fully automatic bottle machine was the Owens, but after this, the importance of the Owens machine decreased. After 1917, the semi-automatic machines greatly decreased in the United States. Between 1916-1924 the Hartford-Empire Company was developing the gob feeder machine (James 1956:21-23). Kendrick 1966:83) describes this device as follows:

> In 1917 an important invention of mechanized bottle production (not used by the Owens machine) was a way of forming a measured amount of molten glass from which a bottle could be blown. It is called a "gob feeder". In this process, a gob of glass is drawn from the tank and cut off by shears. Bottles which have been formed from such a gob, may show a design in the center of its base like a "V" with straight lines radiating out at right angles from the "V".

Bottles produced by the automatic machine have a mold seam that extends to the bore of the finish. By 1920, bottles were refined in that bubbles were eliminated and the thickness of the glass made more uniform.

Manganese was used in bottle glass up to about 1917 in order to give the glass a clearer effect. After this date, ultra-violet rays of the sun would not turn glass "purple", a change caused by the manganese content of the glass. Just when manganese began to be mixed with the glass is not definitely known, but it may date back as far as 1810 (Ferraro and Ferraro 1964:79). Newman (1970:74) suggests a beginning date of 1880 and a terminal date of 1925.

Pertaining to amber glass, Kendrick (1966:59-61) states:

> With the advent of World War I, our main source of manganese (German suppliers) was cut off. In the U.S. bottle industry, selenium became the predominant chemical used to bleach out the unwanted iron-produced aqua color from the glass. A change-of-color event takes place in this glass which has a high selenium content. With exposure to sunlight its clear appearance changes to an amber hue, or, as I would describe it, the color of ripened wheat. It never gets any darker than a good grade of honey, and there is no need to confuse it with a brown bottle.

A characteristic embossing that takes place after 1933 is described by Ferraro and Ferraro (1966:56-60):

> At the time of repeal of prohibition in 1933, the evils characteristic of the pre-prohibition era were well remembered and fresh in the minds of legislators, such antics as a saloon putting cheap whiskey in a bottle with a superior brand name or even bootleggers and moonshiners paying janitors of apartment buildings for empty liquor bottles. As a result, almost every conceivable safeguard or device which would avoid recurrence of those practices was included in Federal legislation. One of the basic changes which was brought about by repeal of prohibition was the type of packages which could be used at the consumer level. The new legislation restricted the sale of distilled alcoholic beverages at the retail level to glass containers of one gallon capacity or less. To avoid or prevent tax evasion, misbranding and adulteration, the law provided that liquor containers must bear the phrase "Federal Law Prohibits Sale or Reuse of This Bottle". The new legislation prohibited absolutely the reuse of liquor ware in any manner. Implemented in 1933, the law was in effect until 1964.

1940-Present

Most of the glass in common use today is one of three types:

(1) Lime glass:

Contains a large proportion of lime and soda or other alkalis. Between 80 and 90 percent of all glass used in the home is of this durable, inexpensive variety. Drinking glasses, milk bottles, jars and containers, and window panes are just a few examples of its varied applications.

(2) Lead glass:

Contains a substantial amount of lead oxide and potash or other alkalis. Most often used for more expensive, quality tableware and decorative pieces.

(3) Borosilicate glass:

> Is heat-resistant glass used for cookware and baking dishes, in which a small percentage of boric oxide helps prevent expansion and cracking under temperature change (Glass Institute of America nd:3).

Some modern glass companies are readily identifiable by characteristic manufacturing attributes produced by the type of machine used or by specific patented shapes. Sometimes only the company that used the bottle can be established, since the manufacturer placed the product's name on the bottle and not his own. During the twentieth century, it has been a common practice to place the company's trademark on the bottle--usually on the base. For example, the Owens-Illinois Company was formed by the merger of the Owens Bottle Company and the Illinois Glass Company in 1929. The trademark of the Illinois Glass Company was an "I" in a diamond, with the long dimension of the diamond horizontal. The Owens Bottle Company had an "O" inside a square. After the merger, the trademark consisted of a combination of these two marks. This same trademark was used in 1941 when the term "Duraglas" was added. In 1954, the present trademark (an "I" within an "O") of the Owens-Illinois Company was adopted (Holscher 1967).

Underneath the trademark, another number identifies the mold in which the bottle was made. Holscher (1967) explains the mold numbers as follows:

> These numbers would go up to the number of mold cavities made which might be, say from 1 to 22. They would be plain numbers if there was one mold cavity in each mold casting. However, many of our bottles are made in mold castings which contain two or three cavities. A plain number could also indicate the front cavity of a two or three cavity mold. A dot after the number indicates that the bottle is made in the rear cavity of a two or three cavity mold. If two dots follow the number, this would indicate quite recent production in which the bottle is made in the middle cavity of a three cavity mold.

Other companies have similar marking systems. For example, the Glass Container Corporation has the overlapped "G" and "C", the company trademark, on the base. Just below it to the left is the plant number, while to the right is the year of manufacture. Still lower to the left is the mold pair number, and at the bottom of the base is the mold or job number. Each glass company has its own layout, but that above may be representative.

1) Bottle and Glass Chronology (Including Introduction Dates): (from Berge 1980)

1785 - 1840----------Large production of lamp chimneys.
ca. 1800----------The mineral water bottle with a pointed bottom to lay on side for wet cork.
1800 to 1870----------The American Historical Flask Period.
ca. 1810----------Preserving (commercial) in glass in France, England, America.
ca. 1811----------Syrups for flavoring drinks.
1820 ----------Invention of the metal mold in England.
1821 ----------English patent on split iron mold, to shape whole bottle (externally).
1841 ----------Nursing bottle patent.
1850s -
late 1870s----------High frequency of mold made bottles with applied finishes but sparse
----------frequencies of makers marks and lettered panels.
1850-1880----------Glass balls for trap shooting.
1857 ----------The "snap" case - making "pontil" mark unnecessary on
hand-made glass bottles.
1858 The Mason fruit or canning jar.
Late 1870s
- 1903 ----------High frequency of mold made bottles with applied
finishes, makers marks and lettered panels.
1860s ----------Kerosene lamps appear.
1861 First lead glass medicine bottles. Shortly after this "French squares"
--- tall, four-sided bottles with beveled edges
--- were put on the market.
1860-1915----------Hey day of bitters (patent medicine) craze.
1871 ----------Pressed glass fire extinguisher patented.
1879 ----------Hutchinson stopper patented.
1879 ----------Edison's first light bulb - hand blown.
ca. 1884 Introduction of milk bottles; very slow in acceptance; complete adoption after
World War I.
1885 - 1910----------A very wide range of closure concepts.
ca. 1885----------Introduction of semi-automatic manufactured bottles.
ca. 1891----------Safety glass with imbedded wire mesh produced.
1896 - 1900----------Bottled Coca-Cola.
1900 to 1920----------Introduction and wide use of metal screw closures.
1903 ----------The patent of Owens automatic bottle machine.
1912 ----------Crown cap universal for carbonated beverages (patented in 1892).
Post 1912----------Particle cork liners in crown caps.
Post 1917----------Little manganese used in making glass (gives purple tint).

1919 ----------Machine-made bottles still heavier than hand-made bottles.
Post 1920----------Introduction of radio tubes.
1920 ----------Complete transition to "crown" for beverages.
1920 - 1930----------Era of wide range of commercial closures, replacing cork stoppers.
1920 - 1933 Prohibition. Manufacture of alcoholic beverage bottles practically negligible. Use of older vessels and reuse by "bootleggers" is popular.
1922 to 1926--------Introduction of the plastic closure (bakelite).
1924 ----------8 oz. and 10 oz. bottles for soft drinks.
1926 ----------Beginning of the baby food era (by 1939 largely in glass).
1930 - 1935----------Standardization of wide range of bottle finishes and closures.
1933 - 1964----------"Federal Law Prohibits..." embossed on liquor bottles.
1934 ----------Wide use of 12 oz. bottles for soft drinks.
1938 ----------Non-returnable beer bottles.
Post 1940----------"No Deposit - No Return" embossed on soda pop bottles.
1945 ----------Bubblers in use in tank for homogeneity; the square milk bottle.
1948 Larger capacity soft drink bottles; non-returnable soft drink bottles.
1953 ----------Synthetic sweeteners of soft drinks.
1954 to 1958--------Introduction of plastic coated bottles for aerosols.
1959 to 1961--------The advent of rigid polyethylene containers.
1963 ----------Wide use of low-calorie soft drinks.

(Above chronology is adapted from Berge 1980; Buckles 1978; and Lorrain 1968).

2) Bottle Chronology: (taken in part from Rock 1980)

Free Blown
to circa 1880

Bottle Molds:
1790-1810----------Dip Molds
1870s-1920s----------Turn Molds
1810-1880----------Iron-hinged bottom mold (2-piece mold)
1870-1910----------Three-part mold
1880-1910----------Closed mouth mold
1904-present----------Automatic bottle machine

Base Marks:
pre-1840-ca. 1870-----Pontil or snap marks
1904-present----------Cut-off scars
1930s-1940s----------Valve marks (milk bottles)

Lip Forms:
1810-1840----------Sheared lips
1840-1920----------Applied lips
1840-1860----------hand applied lips
1880-early 1900s------fired lips

Lipping Tool Marks:
1870-1920----------Smooth-lipped

Closures:
1870s-1900----------Inside screw (whiskey bottles)
1879-1915----------Hutchinson stopper
1882-1920----------Lightning stopper
1892-present----------Crown Cap
1892-present----------with cork liner
1955-present----------with plastic liner
1924-present----------Roll on cap

3) Definitions of Mold Seams and Accessories: (from Berge 1980:61-66)

The types of bottle mold seams described herein are illustrated below. Illustration is taken from Berge (1980:63).

Changes that took place in the growing bottle industry during the nineteenth century resulted in many subtle characteristics found on the container. By 1800 the most widely used method of making bottles and other glassware was by blowing; glass produced by this method is termed hand-blown, free-blown, or off-hand-blown (Lorrain 1968:35).

Lorrain (1968:35) states:

> Surfaces of hand-blown pieces are smooth and shiny and are without impressed designs or letters. Design may be art, engraved, or etched into off-hand-blown pieces after they are cooled but these are not an intrinsic part of the glass. Decorative globs or threads of molten glass may be added to the object before it is cooled but they will also have smooth, shiny surfaces.

Other characteristics of this technique of glass manufacture are the presence of a pontil mark, asymmetry and lack of mold marks.

Munsey (1970:38-50) provides specific details for recognizing techniques used by manufacturers as various molds changed through time. His methods of identifying the molds used on specific bottles and the time range in which these technological techniques were in operation are in part provided below (see Munsey for additional information and illustrations):

I. Non-Shoulder Molds - This type of mold forms the body only and may or may not have mold seams at the shoulder.

Dip Molds. The body and base are formed in this one-piece mold. The bottom is slightly smaller than the shoulder, where there may be a mold seam. This type of mold produces a uniform body shape up to the shoulder, and the finish may be handmade.

A. Hinged molds (late 1700s and 1800s). This type of mold does not have to be tapered, since the mold apparatus opens at the shoulder. The side seams disappear at the shoulder and the body could be embossed.

B. Bottom-hinged mold (ca.1810 to ca.1880). The mold seams on bottles manufactured by this method have seams up the sides and across the base. The seams across the bottom come in two varieties: (1) straight across the bottom; and (2) curves around a slight push-up in the center. The bottom seams may be obliterated to some degree by a pontil scar, except when a snap-case was used, in which case the mold seam would be intact.

Three-part mold with dip mold body (1870 - 1910). This mold produces seams around the shoulder and up to the finish area. It allows versatility in designing the shoulder, such as embossing which, however, was not usually done. It did not provide for embossing on the lower half of the bottle.

C. Three-part leaf mold (handblown period of the 19th century). This type of mold produces three mold seams equally spaced up the sides of the bottle.

D. Post-bottom mold. From this type of mold, seams are produced down the sides and to a circle around the bottom.

E. Cup-bottom mold. The seams from this type of mold run down the sides to the heel and around the outside of the base.

F. Blow-back mold (Patent Nov. 30, 1858). This type of mold leaves a rough and ragged edge around the top of the finish. This rough area is ground down so that closure can seal on the sealing surface. This mold was used in early fruit jars, on which screw threads were molded with the rest of the bottle in one piece.

G. Semi-automatic bottle machine. Mold seams extend the length of vessel (unless obliterated by turn-molding) to within 1/4 inch of the top of the lip. No seams are visible on top. See illustration.

H. Automatic Bottle machine (1904 on). The advent of the automatic bottle machine produced bottles with new mold seams. These molds produce seams up over or around the top of the sealing surface. However, beverage bottles are fire polished to eliminate the seams so they will not cut the mouth of the drinker of the contents.

In addition to the above molds and others, there were processes, accessories or tools that produced distinguishing features on bottles. One such process produced in a full-height mold is called a turn-mold bottle, used between 1880 and 1910. In this process mold seams are obscured by turning the bottle in the mold. Bottles treated this way are highly polished, cannot be embossed, and show horizontal lines or grooves produced as the bottle is turned in the mold. These turn-mold attributes are found more commonly on wine bottles.

During the last half of the nineteenth century a plate mold was used to emboss lettering or designs on the body of bottles. In this process a plate with the particular desired motif was inserted into the mold. The plate mold, or slug plate, as it was known, helped in the standardization of many bottle shapes such as milk bottles.

The Owens automatic bottle machine from about 1904 on produced irregular circular marks, known as cutoff scars (not seams) on the base.

Between about 1930 and 1940 some bottle machines produced what is called a machine-made valve mark. This mark is a circle less than an inch in diameter, similar to a seam. It is found more commonly on wider mouth bottles and glass milk containers.

Lipping tools first developed in England ca. 1830 and used in America ca. 1850 often erased seams on the finish. In this process, which shaped the top of the bottle, a rod was inserted into the bore while the associated clamp on the outside developed the finish as it was rotated. Seams were obliterated by the rotation of the lipping tool; but if the tool was pressed only, seams were produced to the top of the bottle.

Early in the nineteenth century and on, the finish was made by cutting the bottle from the glassblower's rod and reheating the lip or sealing surface to smooth it. In cases where mold seams came to the top of the finish, the seams were obliterated by the reheating. This process produced a flared or fired lip.

A wavy, dimpled, or hammered appearance on a bottle surface is more commonly known as whittle marks because they are thought to have been produced by wooden molds. These marks were actually made by blowing hot glass into a cold mold.

Hand-blown bottles were finished by a method known as empontilling. When the hand-blown bottle was at its desired shape and cut from the blowpipe, the finish had to be shaped and fire-smoothed. This was done by attaching a glass rod to the base to turn the bottle while the finish was formed. After the finish was completed the rod was broken off, leaving a mark known as a pontil scar or "punty".

The snap-case was a mechanical device that gripped the base of the bottle body. Occasionally it left a mark on the side of the bottle where it squeezed the hot glass a little too hard.

Machine blowing eventually eliminated the need for empontilling, and the automatic bottle machine did away with the snap cases.

Summary of bottle seams from Toulouse (1969:587).

1. When there are no seams whatever:

   a. the piece may be free blown without molds, or
   b. it may have been blown in a shoulder height dip mold with hand shaped shoulder

2. A seam disappearing at the shoulder means a bottle blown in a shoulder height hinged mold.

3. Seams disappearing in the neck area may be blown in any mold, but the seam rubbed out with a hand held finishing tool.

4. If a seam crosses the bottom the mold was a two piece, hinged bottom type.

5. A horizontal seam around the widest point, with two side seams going upward means a three part mold based on a dip mold bottom.

6. Three or more side seams from heel to finish means a three part (or more) mold for decorative designs.

7. Circular seam symmetrical with bottom, joining two or more side seams means a post bottom mold.

8. Irregular, feathery, non-symmetrical bottom seams usually mean a machine made bottle from suction machine equipment.

9. Small diameter, indented into surface rather than extending, non-symmetrical, on the bottom, usually is the valve mark of a (see next page)

press-and-blow machine.

10. Circular seam in heel-side wall tangent area means a cup bottom mold.

11. Seams to top of finish, which is then ground to level, usually indicate hand blown in blow-back mold, or snapped off by blow-over method.

12. Circular or oblong seams in side wall, not connected with other seams are made by plated molds.

13. Horizontal seams below finish area mean separate neck rings but do not prove machine manufacture.

14. One or more seams circling top of finish show machine manufacture.

15. "Ghost seams" seams come from the use of a separate blank mold - hence indicate machine manufacture.

472.3 TYPES OF BOTTLE MOLD SEAMS

472.4 Glass Color: (from Berge 1980:82-86)

Glass can be produced in practically all colors by adding specific ingredients to the basic glass mixture. Munsey (1970:37) suggests that the color of glass was obtained by adding the following compounds:

copper, selenium, gold	reds
nickel or manganese	purple (amethyst)
chromium or copper	greens
cobalt or copper	blues
carbon or nickel	browns
iron	greens, yellows
selenium	yellows, pinks
tin or zinc	opal or milkglass
iron slug	"black glass"

In order to obtain clear glass, the raw materials should be free of impurities in the sand. Very dark greenish-amber glass ("black glass") was popular until the middle of the nineteenth century. Before the turn of the century, bottles were predominantly green and aqua. Munsey (1970:37) further states:

> A number of variables can affect the actual color produced including the amount of the compounds used, the degree to which the basic glass mixture is impure, the temperature and the time-temperature relationship, and the reheating necessary to complete a piece of glass.

In the late nineteen hundreds much of the glass sand, which came from Belgium as ballast for ships, was pale green. This may account for many bottles being this color (i.e., pale green or aqua), though it was not desirable for many products. This glass was decolorized by the addition of manganese, which causes glass to turn purple to amethyst when exposed to the ultra violet rays of the sun (Jones 1965a:40).

Chronological Implications of Glass Coloring: (from Rich Fike, personal communication January 1984)

Black glass	alcoholic beverages, e.g., stout, ale, wine, etc., and mineral water.	ca. 1870
Milk glass	medicine, cosmetic, toiletry, food and specialty items.	1890-1960
Aqua glass	has general and very versatile application, used commonly in nearly all functional categories.	ca.1800 - ca.1910
Green glass	has general, versatile use including wine and mineral water vessels.	ca. 1860-present

Amber or brown glass	has general application, including alcoholic beverages, e.g., beer, whiskey.	ca. 1860-present
Blue or cobalt glass	medicines, cosmetics, and specialty use.	ca. 1890 - 1960
Red glass	rare, specialty items.	
Clear glass	general application.	ca. 1875-present

472.5 Beverage Bottle Descriptions:

(B) Alcoholic - Whiskey: "A variety of shapes, including large 'case' bottles which were square in shape, figural bottles, 'coffin flasks' for carrying in the pocket (shaped like a coffin), 'picnic' flasks, or half-pints (which are self-explanatory as to use), small flat and ovoid (quite often embossed) pints or half-pints and the round 'fifth' size were, and are, commonly used for bottling whiskey. The common colors of whiskey bottles are aqua, clear, amber and pale green" (Buckles *et al.* 1978:423).

(D) Alcoholic - Champagne/Wine: "These have changed little over the years. They are tall, cylindrical, may or may not have a 'kick-up', and can come in a variety of colors, but distinctive dark greens or ambers are the most common. Another distinguishing mark is the 'turn-mold'. This means that the mold was greased and rotated to remove the mold marks and a shiny patina was left. This was possible as wine bottles were not embossed, but identified with labels"(Buckles *et al.* 197:422).

(E) Alcoholic - Beer: "In glass, a standard beer bottle shape was adopted by the 1870s. The first bottles of this type were free of embossment, in quart size, and were approximately ten inches high. They featured a cylindrical body about six inches around, with slightly sloping shoulders and a tapered neck and lip about four inches in circumference. These bottles utilized a cork closure that was held in by a wire over the cork and twisted around beneath a ring of glass on the neck. Beginning in about 1870, the eastern and mid-western areas of the country used beer bottles with embossments. Many of these bottles were embossed by the plate mold process. By 1890 the western half of the country, too had an abundance of embossed beer bottles. Everywhere beer bottles were being manufactured mostly in pint and quart sizes" (Munsey 1970:116).

(F) Alcoholic - Ale/Stout: "Two ancient malt beverages, ale and stout, were popular on the frontier long before the appearance of lager. Of higher alcoholic content than beer, these two beverages have a heady character that permitted relatively safe shipment over considerable distances before the time of pasteurization. This factor accounted for their appearance in New Mexico and other remote regions of the West in the 1850s, if not earlier. Ale is a strong, fermented, aromatic malt beverage. It is darker, heavier,

472.5 - ILLUSTRATION OF TYPES OF BEVERAGE BOTTLES (from Fike 1987)

and more bitter than beer. Stout, a very dark ale, has a strong malt flavor and a sweet taste. A multitude of ale and stout bottles were recovered at Fort Union and Fort Laramie, many with remnants of paper labels or cork stoppers. Some of these bottles clearly predate beer bottles found at the same posts, and all indicate that Americans in the West brought with them a taste for these malt beverages" (Wilson 1981:7).

(G) Soda/Mineral Water: The varieties of these bottles consist of the three basic types stressed thus far, ie., blob-top, Hutchinson-type, and crown-cork bottles. However, there are several variations, involving pointed, or torpedo-shaped as it is frequently called, and the round bottom bottles were mostly imports from Europe, notably England. These vessels contained ginger ale primarily (Munsey 1970:105).

"The separation (between soda bottles and mineral water bottles) is hard to maintain because at one period mineral water and soda water were one and the same in many cases. The common sizes of mineral water bottles are pints and quarts but they are also discovered occasionally in other sizes. Since the period of greatest production for mineral water bottles was during the era of cork closures most of the ones located are crude and have hand developed necks and lips. Some, however, were made after the invention of the Lightning stopper and the Hutchinson stopper and are thus located with these closures. Some of these bottles even have crown cork closures. Shapes in mineral water containers are varied and range from the Saratoga types to the very unusual Moses figural bottle." One difficulty in mineral water bottle identification relates to soda water bottles: Both beverages used the blob-top soda water-type bottle. Although many mineral water vessels were produced in the common aqua and light green colors some were manufactured in amber and green. The Saratoga types are unusual because they have beautiful deep shades of green and amber. Blue mineral water bottles are known but are unusual (Munsey 1970:101-103).

Blob-top soda bottles: "The earliest of these bottles had tops that were applied separately during their manufacture. To hold the cork under pressure, a wire was placed over the top of the bottle and secured around the neck. These early blob-top soda bottles can be found with pontil scars and iron pontil marks, but are mostly found with plain bottoms because they became most popular after the development of the snap" (Munsey 1970:104).

Hutchinson-type: "The stopper consisted of a rubber gasket (which came in five sizes to accommodate neck diameters) held between two metal plates and attached to a spring wire stem (which came in three sizes to accommodate neck lengths). A portion of the looped wire stem protruded above the mouth of the bottle while the lower end with the gasket and plates extended far enough into the bottle to allow the gasket to fall below the neck. To seal the bottle after it had been filled the rubber disk was pulled up by the wire stem. The bottle was then inverted and righted; this motion formed the seal--the pressure of the carbonation forced the rubber gasket to remain against the shoulder of the bottle." (Munsey 1970:104).

Crown-cork: "It was Painter's (William) third closure, which was patented in its final form in 1891, that eventually made all other beverage closures obsolete. He called this device the crown cork. This closure was essentially the same as those used on beverage bottles today" (Munsey 1970:105).

472.6 Medical/Chemical Bottle Descriptions:

(K) Pharmaceutical/Drug Store: "There are essentially two major groups of drugs: ethical and proprietary. The bottles to be discussed here will be those used for ethical (prescribed) medicines and the various other types of bottles associated with pharmacies (drugstores), excepting poison bottles which are treated separately. There are two types of prescription bottles: plain and embossed. The plain bottles usually featured sunken panels into which paper labels were glued. These are not especially interesting because in most cases the labels are missing. The popular prescription bottles are the ones with embossments. Beginning in the late 1880s the large glass-manufacturing firms had inserted the customer's personalized plate and then blew a supply of bottles. This was an inexpensive means of obtaining the necessary prescription bottles, and almost all drugstores took advantage of it. Large drugstores and chains of drugstores usually had their own exclusive molds made and did not use plate-molded bottles. A number of bottles are lumped together in the category of drugstore bottles. As a result, sizes within this category vary a great deal. Labeled and glass-stoppered bottles that were reused by pharmacists were usually several inches to ten inches in height. Show-window bottles were generally as tall as several feet; other show bottles were shorter (one or two feet). /Prescription bottles of all types seldom exceeded twelve inches in height. Shapes in all types of drugstore bottles varied greatly except in the reusable labeled bottles, which were mostly cylindrical or square, and prescription bottles, which were mostly oblong. Show-window and display bottles and jars were made in numerous original shapes. Although closures on the more expensive bottles and jars were usually glass stoppers, on the expendable and less expensive prescription bottles the cork closure was common. Embossments, though common on prescription bottles, were for the most part limited to descriptive lettering and some designs. Colors, though not rare prescription and reusable labeled bottles. In other types and most prescription and reusable labeled drugstore bottles, clear glass was predominant" (Munsey 1970:174-175).

(L) Patent/Proprietary Medicine: The term patent medicine has, however, become the generic one for all medicines sold without prescriptions. In 1906 there were over fifty thousand medicines being manufactured and sold in America. By far the majority of these came in glass bottles. Sizes and shapes of these bottles were fairly consistent; standard sizes up to a quart were common, and cylindrical or rectangular were the common shapes. They were also quite consistently aqua or light green. Almost without exception, patent and proprietary medicine bottles utilized a cork closure (Munsey 1970:69).

(M) Cosmetic: (perfume, scent, and cologne bottles) "Before the common use of hinged molds, perfume and scent bottles were either free-blown or blown in a dip mold. Around the turn of the century perfume and scent bottles of great beauty were beginning to be produced in hinged molds. These bottles were often highly decorated and as a result were comparatively expensive, as were their contents.

472.6 ILLUSTRATIONS OF TYPES OF MEDICAL/CHEMICAL BOTTLES
(from Fike 1987)

By the mid-1800s, double scent bottles came into vogue. These interesting containers usually consisted of two separately blown bottles welded together at the base during the manufacturing process the owner to carry both perfume and scent in what for all practical purposes was one container. Cologne bottles are generally larger than perfume bottles. Because of their close relationship, perfume, scent, and cologne bottles are usually considered to be one speciality in typology, and the term 'perfume' has generally become the generic one for all three types. The major interest of perfume bottles lies in their beauty and size. Usually, much time and effort are put into the designing of perfume and related containers. Perfume bottles are generally less than six inches in height and this factor has great appeal to many collectors who associate smallness with quality. Shapes of many kinds can be found in the perfume bottle collection, including figural types. Many shapes are predominantly geometric. In the more common bottle types embossments are of interest. Both lettering and design are to be found on many perfume bottles. While the majority of twentieth-century perfume bottles have been made from clear glass there are many specimens to be located in a wide range of colors. The pre-1900 specimens are especially noted for their colors. Most twentieth-century specimens were made with matching glass stoppers; on the more expensive bottles the stoppers were specially ground to fit. Before 1900 the common cork closure was popular. Sometimes a combination glass and cork stopper was utilized; such closures usually featured a cork ring within the neck of the bottle into which a glass stopper fit" (Munsey 1970:154-155).

(Ø) Poison: "In the early years of the 19th Century there wasn't the legislation or pressure required to make poison bottles 'different', but there was concern which produced brightly colored, odd shaped (i.e. skull and crossbones, coffin), embossed and textural bottles. All these methods were employed to warn both the literate and illiterate populace of the contents. The favorite color seems to be blue but a great variety of other bright colors were employed" (Buckles et al. 178:425).

472.7 Household Bottle Descriptions:

(O) Fruit/Canning Jars: "These were usually cylindrical in shape with a wide mouth and made of clear or aqua glass. They are relatively easy to recognize because of their familiar forms as 'Mason Jars' " (Buckles et al. 1978:424).

(P) Milk Bottles: "These were introduced in the latter part of the 19th century and the first recorded patent was in 1880. These were usually cylindrical (although other shapes do exist), widemouthed, made of clear glass and embossed" (Buckles et al. 1978:425).

(Q) Preserves/Pickles: "Among other late 19th century containers which are easy to recognize are pickle jars. They are generally large and have four to eight sides, are wide mouthed and are often embossed with Gothic arches" (Buckles et al. 1978:425).

(R) Peppersauce/Clubsauce: "Pepper sauces were commonly in bottles smaller than the pickle bottles, in shades of aqua or green, with longer and more slender necks and openings. These were usually square or cylindrical and sometimes employed the Gothic arch embossing similar to the pickle bottles" (Buckles et al. 1978:425).

(S) Mustard: Mustard bottles are generally the same shapes as are in use today. "Often, a particular bottle shape has been associated with a particular product for so long that it is seldom used by manufacturers for anything else" (Munsey 1970:152). Wilson (1981:81) says of these bottles found at Fort Union, New Mexico and Fort Laramie, Wyoming (ca. 1849 to 1891): "Pickle, mustard and relish jars are rare. All such products were packaged in glass and were in common supply as items of commercial trade by the late nineteenth century. It can be concluded that such products were standard items stocked in bulk by the army commissary and that their purchase in small containers was unnecessary. However, too great a reliance should not be placed on this explanation..."

(T) Catsup: "Food containers included a wide variety of sizes, shapes and colors. Many are still in use and easy to recognize, such as catsup and mustard bottles" (Buckles et al. 1978:425).

472.8 Domestic Bottles Descriptions:

472.7 ILLUSTRATION OF TYPES OF HOUSEHOLD BOTTLES
(from Fike 1987)

(V) Ink: "Ink bottles were made in a variety of shapes and colors. The most common shapes are 'cone shapes' with a wide base tapering up to a narrow neck. A variation of the cone shape was called the 'umbrella shape' which had greater heights" (Buckles et al. 1978:424).

(W) Shoe Polish: Shoe polish bottles come in a variety of sizes and shapes. In general shapes can include square, rectangular, and cylindrical. Colors include green, amber, clear, and blue. In general bottle heights appear to range from 2 1/8" to 7 7/8". Embossing and paper labels are common. (Description drawn from examples in Wilson 1981:93-94).

(X) Tooth Powder: "These rather small containers were produced in attractive shapes. Tablet jars featured glass stoppers while most tooth powder bottles had screw caps or cork-encircled stoppers. These tooth powder stoppers usually had a second screw cap at the tip of the stopper; this was to allow for the use of small amounts of tooth powder. Table jars and tooth powder bottles were usually one to several inches high" (Munsey 1970:175).

(C) Other: Includes baby nursing bottles, paste/glue bottles, etc.

472.9 Specialty Bottle Description:

(Y) Figural: "There is a popular parlor game based on the idea that all things in the world can be divided into three general categories: animal, vegetable, and mineral. A similar statement can be made in defining figural bottles, i.e., they are made in the shape of things: animal (including humans), vegetable, and mineral. Figural bottles of both ceramic and glass range from fractions of an ounce to a full gallon. Some of the smallest are the fragrance bottles and some of the largest are spirit containers. In glass specimens, all colors are represented... and each bottle is generally limited to one color. The majority of figural bottles of the earlier types utilized the common cork closure and the more recent specimens come quite often with screw cap closures" (Munsey 1970:95-96).

472.10 Other Glass/Non-Containers Descriptions:

(1) Window: "Window glass is obviously that glass used in windows. However, there are problems in the differentiation of flat side panel bottle fragments from window glass fragments. After considerable observation it was decided that window glass must be flat and between .045 to .130 inches thick. Teague and Shenk (1977:125-126) report that window glass may be datable by seriation of thicknesses and recordation of thicknesses is suggested, if feasible" (Buckles et al. 1978:405).

(2) Chemical Related: Laboratory equipment including mining(assay), medical, beakers, flasks, text tubes, pipettes, thermometers, etc.

(3) Lamp Chimney: "Lamp chimney fragments are very common. They are identifiable as fragile curved glass which breaks into very small pieces. Lamp parts are also common and often have patent dates. Lanterns are less common than lamps and may have been related more to outdoor rather than indoor activities" (Buckles et al. 1978:429; also see Roenke 1978:1-117).

472.11 Decorative Technique Description:

(1) Plain

(2) Embossed

(3) All other decorative glass including cut, pressed, engraved, etched, applique, etc.

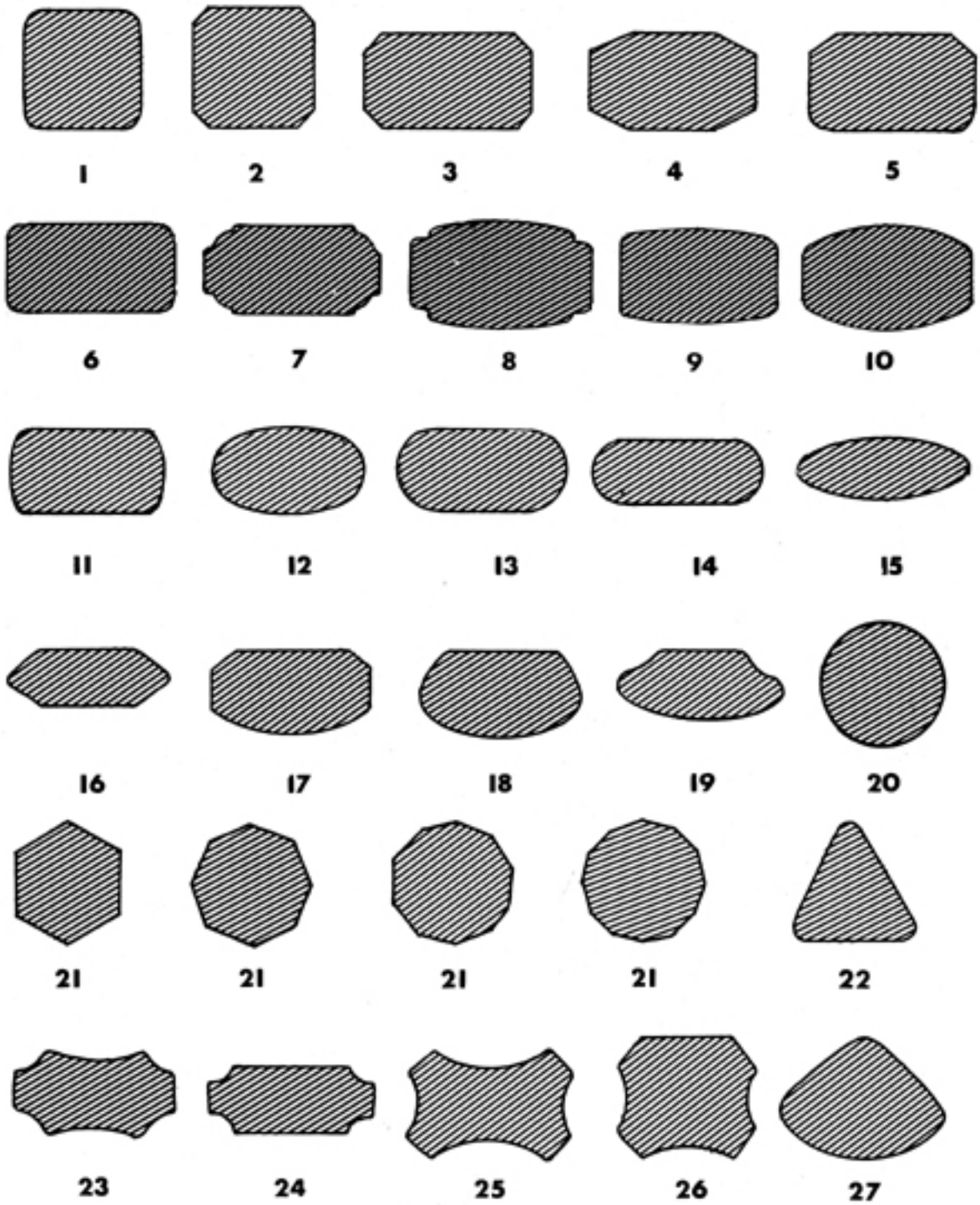
472.12 Trademarks:

"Trademarks, whether registered or not, brand names, and other marks and symbols of identification found on bottles are datum points in determining the history and ages of the collectors' bottles. When the owner of the mark is known, and when more exact dates can be assigned to its use, the mark becomes a means of dating the piece upon which it appears. If the mark was used for many years, we may have to rely on other considerations in order to date the piece within the mark's span of years. If the period of use of the mark was short, the age of the bottle may be pinpointed to a short period of time. In some instances, lucky for the collector but unlucky for the user of the mark, the period may be reduced to one or two years. One factory making beer bottles in the 1880s, whose ownership, name, and mark changed five times in eleven years, has helped historical archeologists date a number of sites in the western United States" (Toulouse 1971:7).

"Bottles which are made in molds commonly exhibit some intentional markings which are produced from the molds as identifications of the bottle makers (Toulouse 1972). These 'makers marks' are primarily located on the bottle bases. The marks evolved over time and the time spans of many of their stylistic variants can be identified. These distinctive makers marks are the most exact and wide-spread attributes of bottles which aid in dating bottles of the late 19th and early 20th Centuries" (Buckles et al. 1978:427).

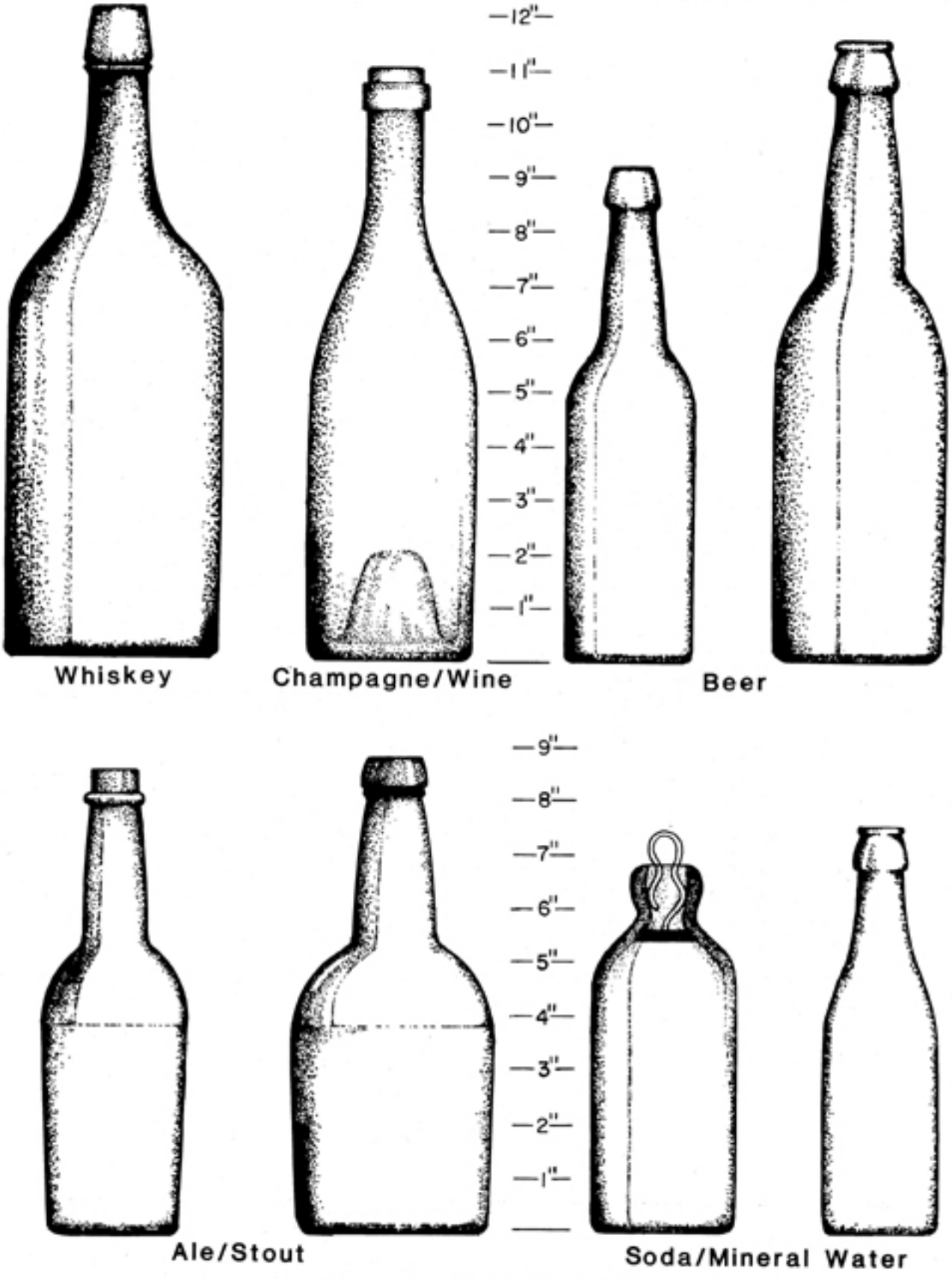
The most useful publication for identifying makers marks is Bottle Makers and Their Marks (Toulouse 1971). In addition, local makers marks can usually be traced through local telephone directories and informants.

"A factor to consider when identifying bottles of the past is that the functions bottles were manufactured for may not have been their function at a site. 'Used bottle dealers' were common up until prohibition (1918), particularly in the west (Wilson 1968:24). Bottles were reused for a number of functions but most commonly for containers for beer, whiskey, wine and other liquors and 'spirits'. These 'liquid refreshments' were commonly sold to saloons or stores by the barrel (whiskey and wine) or keg (beer) and then drawn off as ordered by the customers for home consumption. The customer would have to provide his own bottle, or quite often a bucket (necessitating fairly rapid consumption before the contents went flat) (Wilson 1968:22,168)" (Buckles et al. 1978:426).



BASE PROFILES: 1 HOPKINS SQUARE; 2 FRENCH SQUARE; 3 BLAKE (VARIANT 1); 4 BLAKE (VARIANT 2); 5 BEVELED IDEAL; 6 EXCELSIOR, WINDSOR OVAL OR ROUND CORNERED BLAKE; 7 OBLONG PRESCRIPTION; 8 UNION OVAL; 9 CROWN OVAL; 10 SALAMANDER OVAL; 11 MONARCH OR ERIE OVAL; 12 PLAIN OVAL; 13 ELIXIR OR HANDY; 14 SLENDER HANDY; 15 OVAL; 16 IRREGULAR POLYGON; 17 HUB OR GOLDEN GATE OVAL; 18 BUFFALO OR PHILADELPHIA OVAL; 19 CLAMSHELL; 20 ROUND; 21 POLYGON; 22 TRIANGLE; 23 FLUTED OBLONG (VARIANT 1); 24 FLUTED OBLONG (VARIANT 2); 25 CONCAVE; 26 FLUTED SQUARE; 27 SPHERICAL TRIANGLE *(Berge, 1980; Dominion Glass Co. Catalog, n.d.; James, 1967 (1902, Whitall Tatum Glass Co. Catalog Reprint); Putnam, 1965 (1911, Illinois Glass Co. Catalog Reprint.): 1907, Peter Van Schaack & Sons Drug Catalog).*

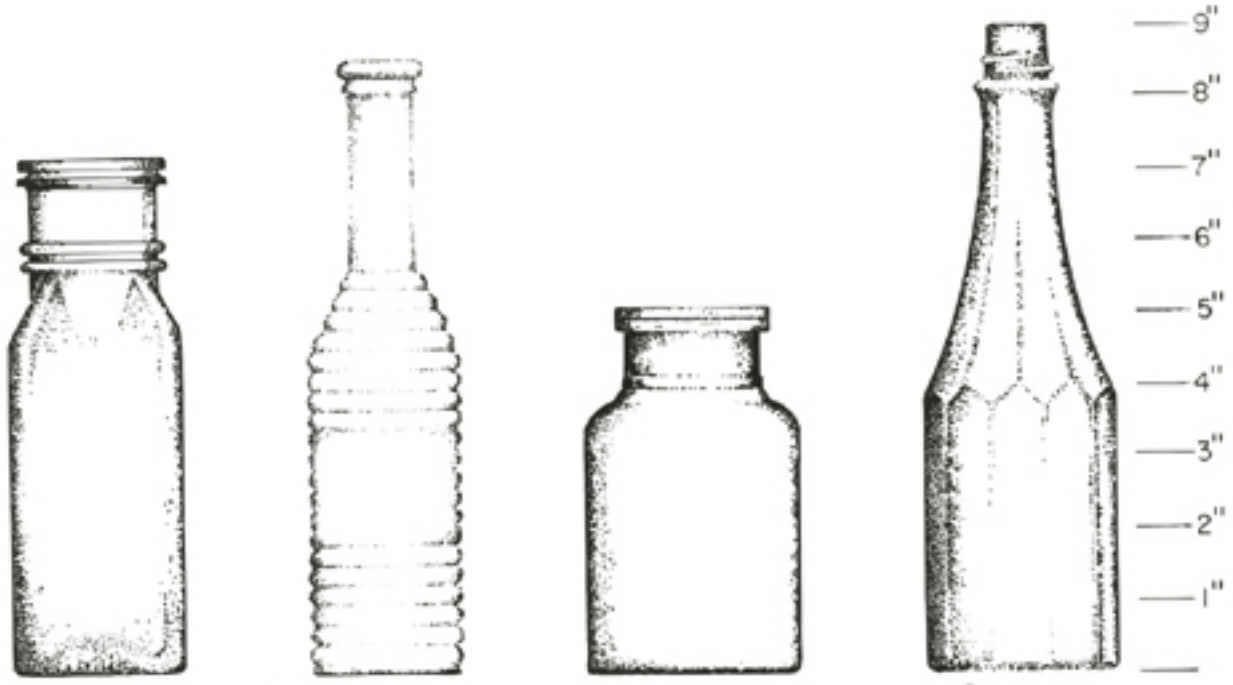
472.5 - ILLUSTRATION OF TYPES OF BEVERAGE BOTTLES (from Fike 1987)



472.2 ILLUSTRATION OF TYPES OF HOUSEHOLD BOTTLES
(FROM FIKE 1987)

Fruit/Canning Jars

Milk Bottle



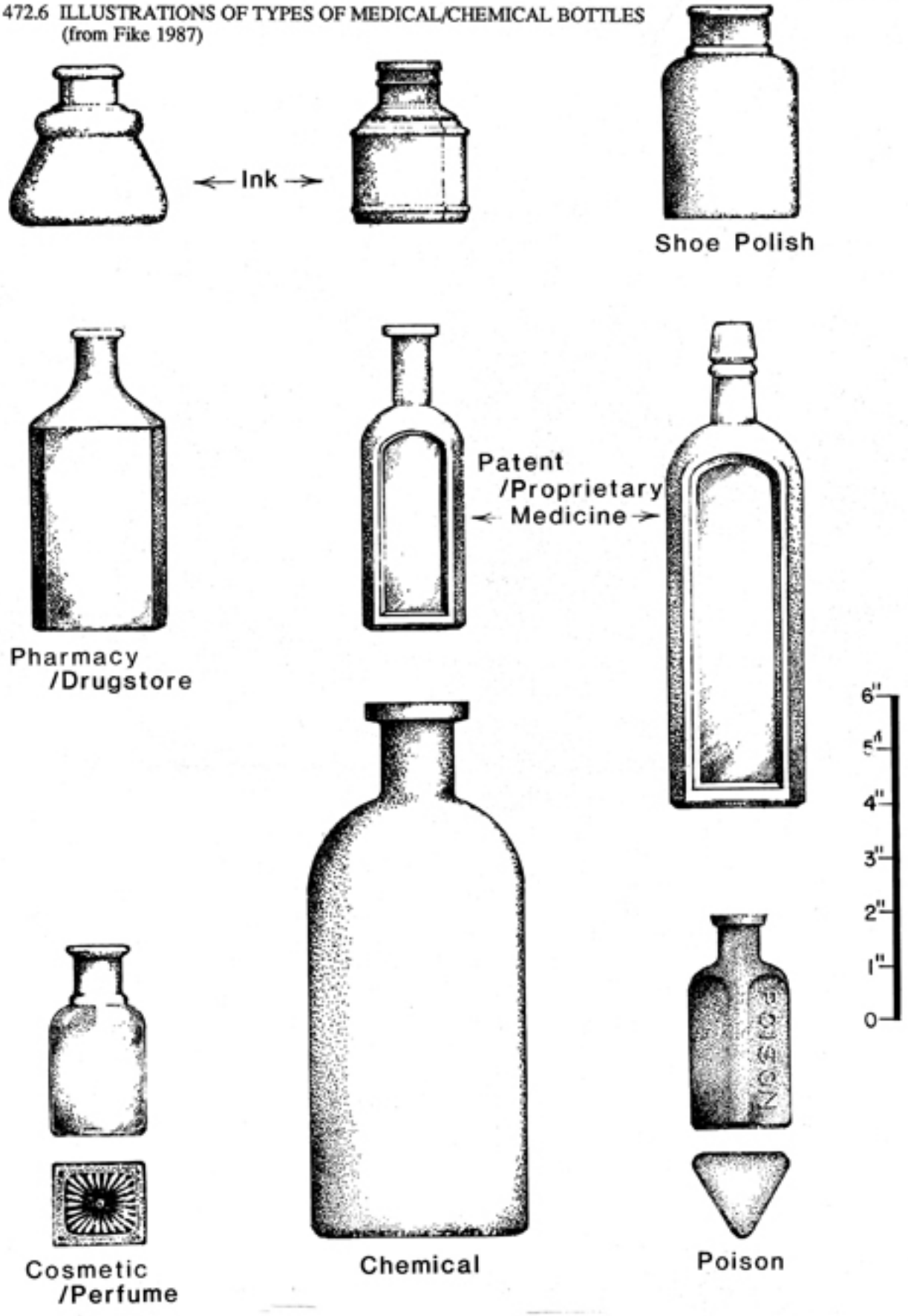
Preserve /Pickle

Peppersauce

Mustard

Catsup

472.6 ILLUSTRATIONS OF TYPES OF MEDICAL/CHEMICAL BOTTLES
(from Fike 1987)



472.3 TYPES OF BOTTLE MOLD SEAMS

DIP MOLD

HINGED SHOULDER - HEIGHT MOLD

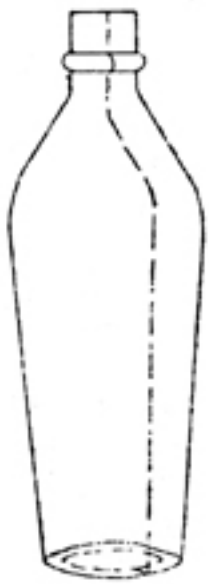
BOTTOM - HINGED MOLD

THREE PART DIP MOLD

THREE - PART LEAF MOLD

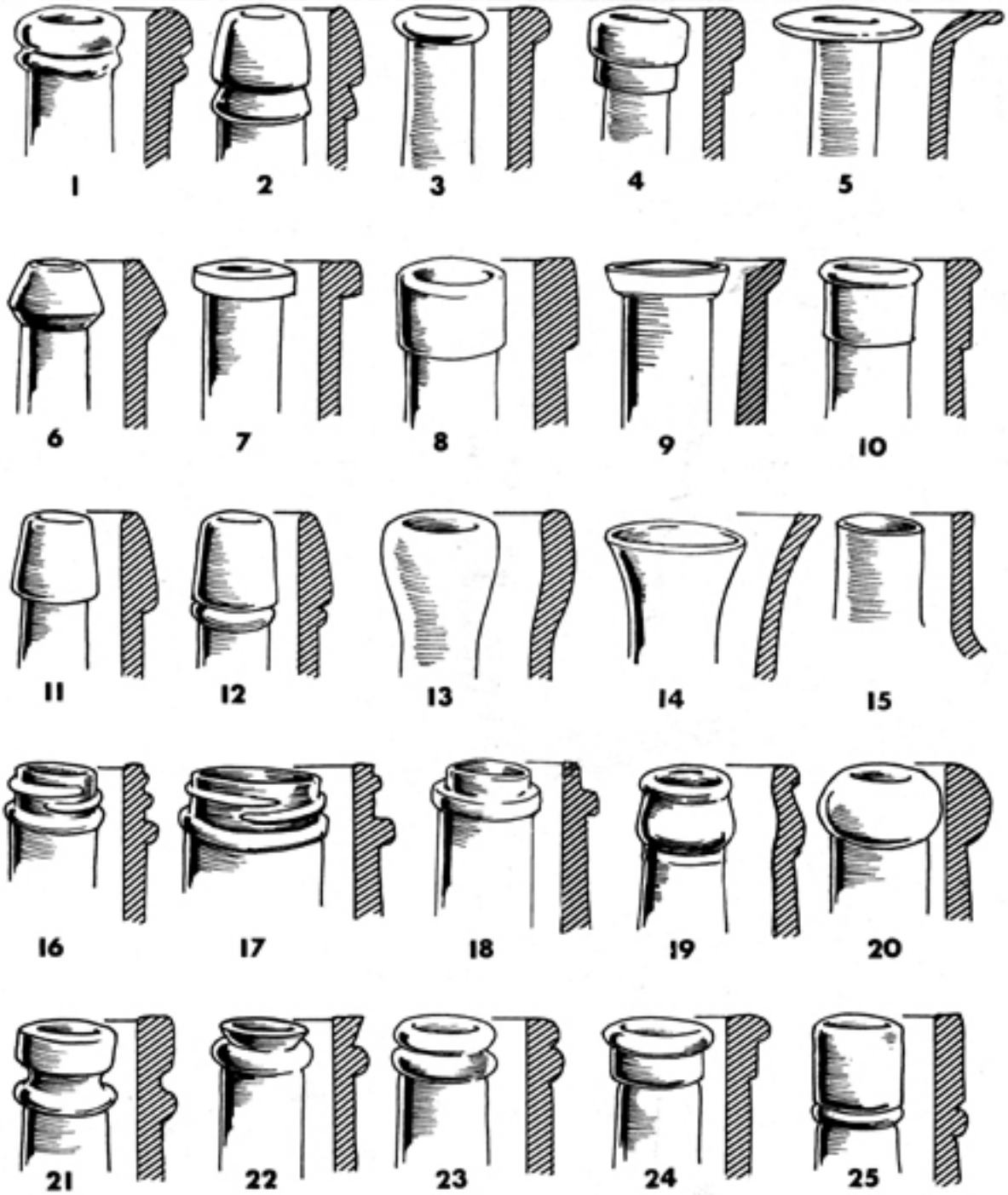
POST - BOTTOM MOLD

CUP - BOTTOM MOLD



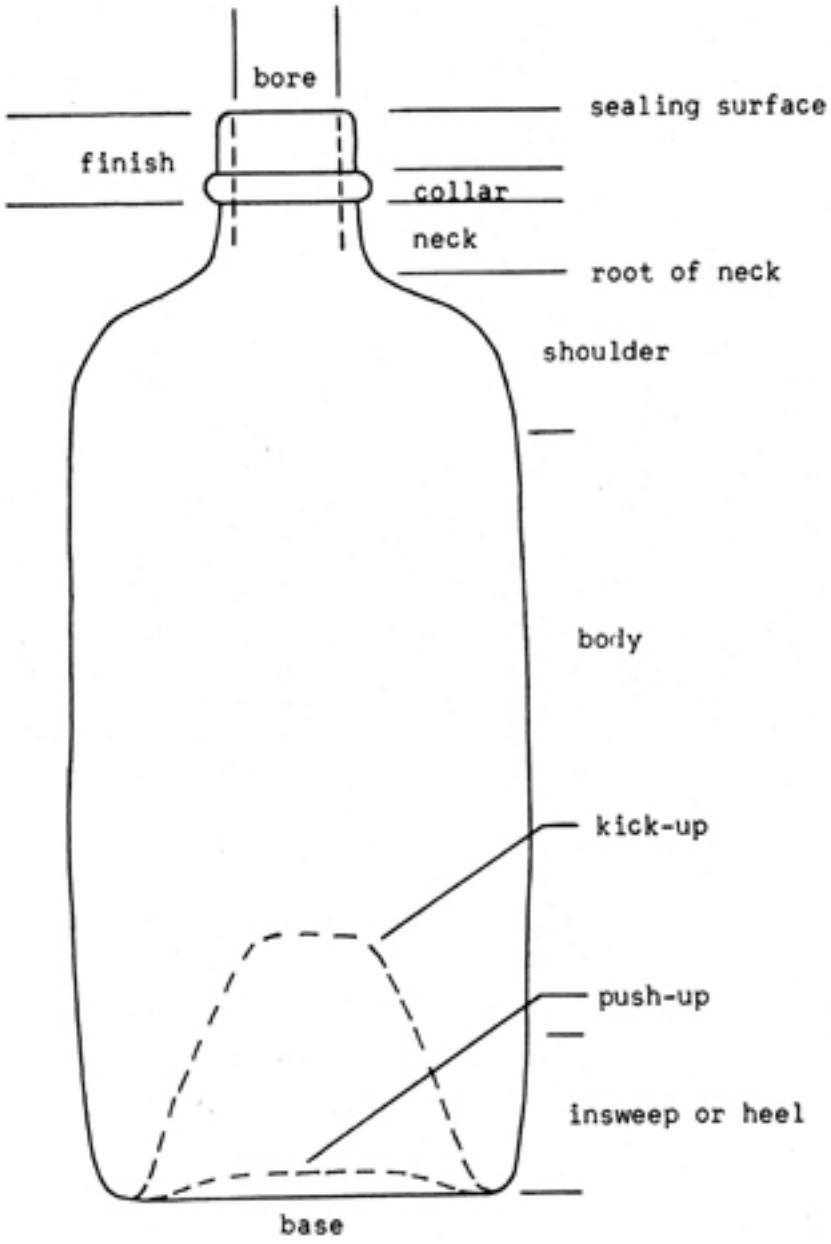
AUTOMATIC BOTTLE MACHINE

472.2B BOTTLE NECK FINISHES
(from Fike 1987)



NECK FINISHES: 1 DOUBLE RING; 2 DOUBLE OIL OR MINERAL; 3 BEAD; 4 STOVE PIPE; 5 WIDE PRESCRIPTION; 6 SHEARED RING (OCCASIONALLY GROUND); 7 FLAT OR PATENT; 8 ENGLISH RING, DEEP LIP OR PACKER; 9 PRESCRIPTION; 10 REINFORCED EXTRACT; 11 RING OR OIL; 12 WINE OR BRANDY; 13 GLOBULAR FLARE; 14 FLARE OR TRUMPET; 15 SHEARED OR BLOW OVER (USUALLY GROUND); 16 SMALL MOUTH EXTERNAL THREAD; 17 WIDE MOUTH EXTERNAL THREAD 18 CHAMPAGNE; 19 CROWN; 20 BLOB; 21 GROOVED RING; 22 FLARED RING; 23 STACKED RING; 24 COLLARED RING; 25 STRAIGHT BRANDY OR WINE *(1911, Cumberland Glass Co. Catalog; Dominion Glass Co. Catalog, n.d.; James, 1967 (1902, Whitall Tatum Glass Co. Catalog Reprint); Lohman, 1972 (1904, Whitney Glass Co. Catalog Reprint); Putnam, 1965 (1911, Illinois Glass Co. Catalog Reprint); 1880 Whitall Tatum Glass Co. Catalog).*

472.2A BOTTLE TERMINOLOGY ILLUSTRATION
(from Berge 1980:39)



473 - Historic Ceramics

473.1 IMACS Classification: see IMACS User's Guide for complete Historic ceramics classifications.

473.2 Historic Ceramics Introduction

The components which make up a ceramic artifact are the paste, glaze, decoration, the name (if any) of the decorative pattern, and the maker's mark.

Paste refers to the clay fabric which forms the vessel. It is composed of clay and added or natural fluxes which are formed in a wet malleable state then fired. The paste is what is commonly referred to as earthenware, stoneware, porcelain, etc.

Glaze is the glassy vitreous coating on the outside of a ceramic vessel. It is composed of fused silicate mixtures which are bonded to the ceramic surface.

Decorative techniques are the methods by which pattern is applied to the ceramic surface. They can be applied under the glaze or over the glaze. Some call for the application of color by a brush or decal, others, such as molded-relief techniques alter the paste itself before the firing to produce a desired texture or form.

The third component, historic pattern name, is really an extension or elaboration of the decorative technique. It refers to the manufacturer's name used to list (as in a catalogue) a particular pattern (in which case the pattern name might be printed on the base of the vessel). It can also refer to the informal labels archaeologists give to commonly encountered patterns or designs which are awaiting the illumination of research to provide official manufacturer's nomenclature.

Maker's marks or trademarks are the printed or impressed marks usually applied to the base of a ceramic vessel and which provide information on the manufacturer, date, and national origin of the ceramic artifact.

473.3 History:

Most ceramic tableware artifacts encountered in the western U.S. represent Euro-American attempts to imitate the expensive Chinese porcelains which strongly influenced the Euro-American market between 16-19th Centuries. During that period, European Delft, salt glaze while stoneware, as well as creamware, pearlware, and other "improved" white earthenwares were developed. By the beginning of the 19th Century, British ceramic tableware dominated the

American tableware market, however, French, German, Chinese, Russian, and American made goods also occurred in the western U.S. at the time. By the beginning of the 20th Century, American potters wrested dominance in the tableware market from the hands of the British.

The following sequence is quite general and it no doubt varies somewhat from region to region depending on the distance to costal ports and other transportation and ethnic factors. In late-settled sites, the earlier portions of this chronology are probably missing entirely.

1) Chinese Export Porcelains

The earliest imported ceramics to appear in the west are Chinese Export Porcelains. The end product of 2,000 years of ceramic technology, Chinese export porcelains remained superior to European ceramics until well into the 19th Century.

The porcelain trade proved so profitable to China that the secret of porcelain manufacture was jealously guarded on pain of death by the Chinese government. (Weiss 1971)

Chinese export porcelains were made for the European market and often modified to meet the tastes and vessel form needs of European and American consumers. These tablewares had fine textured vitreous, blue-white, translucent pastes that were covered by a blue tinted clear glaze. The most popular decorative technique was the blue and white handpainted underglaze motif of which Nanking and Canton, forerunners of the Willow pattern, were the most famous historic pattern names. Nanking and Canton decorated porcelains are not uncommon in west coast sites dating from the first part of the 19th Century.

Chinese "Lowestoft" porcelain was quite popular through the beginning of the 19th Century when entire dinnerware services were made to order in China for American consumers. Often these porcelains were painted with armorial emblems, pictures, or other symbols which included the name of the purchaser or their family crest. Pictures commemorating historical events or western landscapes scenes were also popular Lowestoft motifs (Eberlain and Ramsdell 1925:70).

In the 1820's, Rose Medallion style porcelains with gaudy red patterns and pictures of mandarin figures became popular and continued in popularity for many years (Eberlain and Ramsdell 1925: 76).

Chinese export porcelains dropped in quality during the first part of the 19th Century (Tindall 1975) and this along with the rise in popularity of British white earthenwares and the destruction of the major Chinese Potteries at Ching-te-chen led to a decline in the availability of Chinese porcelains in the western market by the 1850's (Weiss 1971:46).

2) English White Earthenware

During the 18th Century, potters in Staffordshire, England experimented with a series of white paste ceramics in an attempt to emulate the beautiful and expensive Chinese Export Porcelains of the same time period.

These experiments resulted in the invention of salt glaze white stoneware which enjoyed an est. 30 years of popularity in the first part of the 18th Century (Noel-Hume, 1969:14) and the popular and enduring white earthenwares known as creamware and pearlware.

Introduced by the Wedgewood Company in the 1760's as "Queensware" (Noel-Hume, 1969) creamware, is characterized by a chalky, soft and porous cream colored paste covered with a satiny clear glaze which pools yellow in vessel crevices. Creamware vessels are usually very thinly potted and plainly decorated with molded-relief or black transfer print designs.

Pearlware was a variation rather than a true improvement on creamware (Noel-Hume, 1969:23). The pearlware paste is similarly chalky, off-white, and porous, but the glaze has added cobalt bluing agents which cause the glaze to pool blue-green in vessel crevices.

Pearlware vessels are usually thicker than creamware vessels and more often decorated with blue transfer print designs. One common pearlware vessel type is a dinner plate or bowl decorated with a glazed-incised edge design known as shelledge or feather-edge.

English made pearlwares and more refined white earthenwares decorated with transfer printing, are by far the most commonly encountered tableware ceramics in western sites dating from the first half of the 19th Century. Transfer print designs were most often blue in imitation of the Chinese blue on white porcelains, and in fact, the most popular blue transfer print pattern - known as "Willow" is a direct adaptation of a Chinese blue on white design. Transfer print decorations commonly depicted idyllic landscape scenes or historic events.

Transfer prints also occur in red, black, green, purple, and other color schemes.

3) The Ironstone Era

The following discussion is excerpted from Felton and Schulz's The Diaz Collection (1983):

> By the late 1840s, a dramatic stylistic shift in popular British earthenwares had begun which is clearly evident in archaeological assemblages from the 1850s in regions as distant as California. The change entailed a decline in the popularity of transfer-printed and other colorfully decorated earthenwares which had predominated since the late eighteenth century, and a rapid rise in the

availability of "White Ironstone" style vessels. Although the term "Ironstone" had been applied to some improved earthenware bodies since at least 1813, we use it here to refer to a distinct stylistic trend, not the technological improvements in the clay mixtures themselves. "White Ironstone" style vessels commonly bear molded relief patterns rather than colored decorations, and have thicker vessel walls than most earlier creamware and pearlware forms. The bodies of some of these pieces are as porous as common earthenwares, while others are more comparable in this regard to stoneware or porcelain. the latter are variously referred to as "semi-vitreous China", "Hotel China", and "opaque porcelain." Vessels of this style were sold at high prices when first introduced, although it seems probably that their manufacture was cheaper than that of the more labor-intensive colored decorative styles. Perhaps this shift to less labor-intensive modes of decoration in the late 1840s and 1850s was in part a response by British manufacturers to the growth of labor organizations and legislation that limited work hours and child labor.

The "White Ironstone" style appears to have dominated the middle-class market in the United States from the 1850s to at least the 1890s. These wares ("White Improved Earthenwares" and "Opaque Porcelain") comprise about 70% to 90% of three California collections (dated 1857-1878) reported by Praetzellis (1980:75, Fig. 20).*

N.B. Complete references are available in The Diaz Collection, 1983, and do not appear in the IMACS bibliography.

4) American Ceramic Tableware

Prior to 1900, English pottery was considered the finest tableware available in the U.S. American made products which mimicked the British product were considered at best second class. No where was this sentiment better expressed than in the pages of 1897 issue of the Sears Catalogue: "Our stock of tableware includes only the finest selection of crockery... American made crockery is well known to be inferior to the English...manufacture..." (Isreal 1981).

In 1898, the American Potters Guild was formed to promote American-made ceramic tableware. Apparently it was successful because by 1909 the Sears Catalogue was carrying a full line of the "finest crockery" which now included goods from several American manufacturers, most notably Homer and Laughlin of East Liverpool, Ohio (Sears, Roebuck and Co. 1909, reprint 1979; Gates and Ormerod, 1982).

Though identical products were made by British manufacturers, American Potters became famous for their sturdy and simply decorated vitreous earthenwares, commonly known as "Hotel China."

5) Overseas Chinese Ceramics

In the 1850's Chinese ceramics returned in force to the American scene for use by Chinese sojourners to the mining and railroad camps of the far west. These ceramics were naturally quite different in decoration and vessel form from those made earlier for the Euro-American export market. Three broad functional categories can be identified: tableware, utility and storage containers, and opium pipe bowls (see 473.8 for illustrations).

Tablewares: These most commonly include rice bowls and tea cups. Serving dishes, soup spoons, and small wine cups are less common. Tablewares are made from a fine, white porcelain or stoneware, with four decorative styles, including:

Bamboo (also called Three Circles and Dragonfly, or Swatow).
Four Seasons (or Four Flowers, a hand-painted overglaze polychrome).
Double Happiness (or Swirl).
Celadon (or Winter Green, see below).

For a more in detailed discussion of these types see Chace 1976.

Utility Wares: Utility stonewares or storage vessels are distinctively different, but no less common than tablewares. Generally composed of a coarse, sometimes gritty buff or grey-brown paste with a thick brown or metallic grey-black jian you glaze, utility vessels were generally shipped from China containing soy sauce, liquor, ginger, dried vegetables, and other foods. See Chace (1976) for a description of these vessel forms.

Opium Pipe Bowls: Although highly variable, opium pipe bowls are generally the size and shape of doorknobs. Round styles are most common, followed by 8-sided and round/10-sided. All bowls have a slightly convex smoking surface with a small (1-3mm) smoking hole in the center, sometimes with an insert, and a larger hole on the bottom with a flange and neck. The clay neck was often removed and replaced with a metal ferrule. Bowls are made of stoneware or earthenware in a variety of colors, commonly orange or grey. Surfaces may be plain, burnished, slipped, or glazed. Small Chinese characters or decorations are stamped on the bottom or side. The smoking surface immediately around the small hole may be burned and worn from preparing and igniting the opium pellet. This part of the bowl is thin and easily broken. For more detailed information, see Etter 1980, or Wylie and Fike 1986.

473.4 Historic Ceramics Attribute Descriptions:

Paste:

Paste attributes are most accurately determined by examining an unglazed, preferably clean or freshly broken ceramic surface. Data on two of several paste attributes is requested on the IMACS form. These attributes: paste color and paste texture, are readily observable in the field and the resulting descriptions are reasonably consistent. This paste information along with surface treatment, vessel form, and maker's mark can provide enough data to evaluate the function, origin, age, and socio-economic relevance of the ceramic artifact.

Paste Color:

Virtually any paste color is possible, however, the most common paste colors are variations of white or off white, yellow/buff, red-brown, and gray. Often paste colors are indicative of certain vessel functions, for example, white paste suggests tableware or personal artifacts, while a yellow/buff paste color suggests crockery or mixing bowls.

Texture:

For the sake of simplicity, texture is described as either coarse or fine. Generally a range of texture is likely, however, an adequate descriptive cut off is grain size. If an unglazed edge has visible grains, the size of sand or larger, it is coarse. If it has a chalky, powdery, or glassy appearance, it is fine.

The attributes of porosity, hardness, and translucence are often used to distinguish earthenware, stoneware, and porcelain, however, the tests for these attributes can require considerable ceramic expertise to produce consistent results and can be time consuming or unwieldy in the field. IMACS does not request data for these attributes, however, a brief discussion of their application to paste identification has been included for users with a specific interest in ceramics.

Porosity:

Relative porosity or permeability to water can be determined by touching a clean unglazed ceramic surface to your tongue. If it sticks, it is porous, and if it does not stick it is non-porous or vitreous. Stoneware, porcelain, and vitreous earthenwares are non-porous and do not stick. Common pottery, most white earthenware (except vitreous varieties), and some yellow ware and red-ware are porous and stick when applied to the tongue. Some Bennington or Rockingham-glazed yellow earthenware is vitreous and will not stick.

Hardness:

Take a sharp, pointed tool and scrape firmly on the exposed, fresh break of a ceramic sherd. If you can dislodge grains or easily make a scratch you have an unimproved earthenware or common pottery sherd. If it takes a great deal of pressure to make a scratch you have a vitreous or improved earthenware. Good stoneware or porcelain will not scratch. (Adapted from Costello, personal communication, April, 1985).

Translucence:

Only porcelain and some varieties of fine Chinese stoneware exhibit translucence: the quality of permitting the passage of light. This can be observed by looking at a light through the thin vessel wall - if light can be observed, the vessel is either porcelain or fine Chinese stoneware.

Ware Definitions (Based on Chace 1976; Ketchum 1983; and Rado 1969)

I. Common Pottery (coarse or unrefined earthenware, terra cotta)

Paste Attributes: Usually red-brown, coarse, porous, soft.

Common Surface Treatments: None (flowerpot), clear glaze, handpainted, slip, sgrafito.

Common Vessel Forms: Flowerpot, crocks, other utility vessels.

*Majolica/Delft: A 12th century European pottery common until the early 19th century, is composed of a refined common pottery paste of red-brown or dark buff color covered with an opaque white "tin enamel" glaze, handpainted with bright, usually polychrome designs. Majolica occurs in early 19th southern Californian sites dating from the Mexican period. (Costello, personal communication, 1985).

II. Earthenware (refined)

*White Earthenware (creamware, pearlware, most varieties of Ironstone).

Paste Attributes: White/off white, fine, porous, soft.

Common Surface Treatments: Usually clear glaze with a variety of decoration including: molded-relief, transfer printing, flow blue, handpainting (over and under

glaze), engine turned (annular), decal, and others.

Common Vessel Forms: Tableware, decorative vessels, chamber pots, and other toiletry vessels.

*Vitreous China or Earthenware (Semi-porcelain, Hotel Ware, Opaque Porcelain, some Ironstone).

Paste Attributes: White/grey-white, fine, non-porous, hard.

Common Surface Treatments: Usually clear glaze with molded-relief, decal, simple handpainted or engine-turned band, transfer print.

Common Vessel Forms: Tableware (often sturdy restaurant varieties), decorative vessels, toiletry vessels.

*Yellow Ware

Paste Attributes: Yellow/buff, usually fine (but can be quite coarse), usually porous, soft. Some varieties appear to be harder and non-porous, particularly those with Rockingham or other flint enamel glazes.

Common Surface Treatments: Usually clear glaze allowing the natural paste color to show through as a mustard color, frequently the interiors of the bowls are slipped or glazed opaque white. Other surface treatments include molded-relief designs, a single painted band, mocha or moss designs, spatter or sponge designs, mottled brown flint enamel glaze (Rockingham or Bennington).

Common Vessel Forms: Mixing bowls, mugs, crockery, kitchen utensils, e.g., colanders, meat tenderizers, rundlets (barrel shaped containers). "Rebeccah-at-the-well" tea pot.

Note: Yellow Ware is a result of an industrial ceramic age after 1830, and was manufactured primarily in East Liverpool, Ohio in great quantities between 1830 and 1900. (Boger 1971).

*Red Ware

Paste Attributes: Red-brown, fine, porous, soft (some varieties are hard and non-porous enough to resemble stoneware).

Common Surface Treatments: Clear glaze allowing the natural paste color to show through, sometimes interiors are slipped white, painted band, mocha or moss designs, metallic lustre washes over clear or brown glazed, sponge or spatter designs, sgraffito designs through contrasting slip.

Common Vessel Forms: Mugs, jugs, pitchers, molds, crocks, rundlets (barrel-shaped containers).

III. Stoneware

*Utility Stoneware

Euro:American Utility Stoneware

Paste Attributes: Usually grey or buff, coarse, non-porous, hard.

Common Surface Treatments: Salt glaze, slip/trailing, dark brown "Albany" slip (particularly on vessel interior), cobalt blue handpainted designs, sgraffito.

Common Vessel Forms: Mineral water jugs, ink bottles, crockery, pickle jar, rundlets, ginger beer jars.

Chinese Utility Stoneware

Paste Attributes: Usually buff to brown, coarse (sometimes tiny chunks of gravel are visible in the paste and poking through the glaze), non-porous, hard.

Common Surface Treatments: Thick brown glaze (jian you, or "Tiger" glaze), iridescent black-brown glaze, turquoise blue glaze and white glaze over molded-relief or impressed designs (ginger jars).

Common Vessel Forms: Soy sauce, pickle vegetable, large globular storage jars, wine or liquor jars, ginger jars, various storage vessels. (See Chace, 1976 for vessel illustrations).

*Refined Stoneware

Euro-American Fine Stoneware

Paste Attributes: Usually light grey or buff, fine, non-porous, hard (some redware in fact may be red stoneware).

Common Surface Treatments: Clear glaze or golden brown "Bristol" glaze (ale bottles), modern stoneware tableware usually has a clear or colored glaze with a manufactured or handpainted design.

Common Vessel Forms: Ale bottles (often two tone clear and golden brown glaze on a fine buff body), some good crockery and mugs.

Chinese Fine Stoneware

Paste Attributes: Usually light grey with few small, dark inclusions.

Common Surface Treatments: Usually blue tinted clear glaze with handpainted underglaze design e.g., "Bamboo" some argue that Bamboo bowls are in fact crude porcelain and not stoneware.

Common Vessel Forms: Medium sized "rice" bowls.

IV. Porcelain

*Euro-American Porcelain

Paste Attributes: Pure white, fine (almost glassy), translucent, non-porous, hard.

Common Surface Treatments: Clear glaze, molded-relief, decal, gilding, gaudy handpainted floral designs,sprigging or other applied decorations.

Common Vessel Forms: Usually delicate tableware (tea cups and saucers), decorative vessels, commemorative display pieces.

*Chinese Porcelain

Paste Attributes: Blue-white (occasionally with some darker inclusions), fine, translucent, non-porous, hard.

Common Surface Treatments: Blue-tinted clear glaze, blue-green "celadon" glaze, overglaze enamel handpainted design e.g., Four seasons or Four Flowers design, underglaze handpainted designs e.g., "Double happiness" or "Swatow" designs.

Common Vessel Forms: Tableware, tea sets, decorative and commemorative vessels (export porcelain), rice bowls, spoons, etc.

473.5 Surface Treatment

Ceramic surface treatments occur in a variety of combinations, often with two or more decorative techniques in addition to a glaze as in a molded-relief saucer with transfer print design under a clear glaze. The site form requests description of the glaze, the most distinctive decorative technique and the pattern name if known. Definitions of common glazed, decorative techniques and pattern names are described below:

Glaze:

The definition of glaze is a glassy, vitreous coating which is usually prepared from silicate mixtures bonded to ceramic surfaces. Maturing temperatures vary according to ingredients (Parmalee 1973; Rado 1969).

Glazes vary in color and texture according to their chemical constituents and firing temperatures. Glaze mixtures are fused to the ceramic paste surface during firing to produce a vitreous veneer which can be both protective and decorative. Porous paste ceramics must be glazed in order to be waterproof and sanitary.

Some glazes are used only with certain paste types due to their fusing constituents and required maturing temperatures. Salt glaze, for example, requires the extremely high temperatures characteristic of stoneware firing in order to vaporize sodium chloride for fusing. Glazes also enjoy periods of market popularity as well as revivals. Rockingham flint enamel glaze, which was popular between 1830 and 1870, is occasionally revived for use on decorative vessels today..

Glaze and Slip Types:

Bennington: Often used synonymously with "Rockingham" glaze. Bennington, Vermont potteries produced all ware types from earthenware to porcelain, but are most famous for an improvement patented in 1849 on the Rockingham, mottled brown glaze. (Barclay 1976; Norman-Wilcox 1965).

Bristol Glaze: A glassy, creamy glaze sometimes colored with iron to make it brown, most commonly found on cylindrical vessels formed by an extruder, glazed half brown, half cream color: for example: stoneware ale bottles (Barclay 1976). Bristol glaze has been used on commercially made stoneware since the late 19th century (C. Malcom Watkins 1978).

Celadon: A glaze used on chinese porcelain which is derived from iron and ranges in color from putty to sea green to blue. Winter Green: may be a universal marker for late 19th/early 20th century Overseas Chinese sites. In addition to being very common, they were the most expensive type of Overseas Chinese tableware (Sando and Felton 1984). They exhibit the following distinctive characteristics (Wylie and Geer 1983):

1. Green or blue-green translucent glaze, full of minute bubbles, that exhibits variation in color density depending on thickness.

2. An extremely heavy exterior glaze, especially at the corner of the foot.

3. A very thin, almost transparent interior glaze.

4. A fine, white vitreous paste.

5. A scraped rim, sometimes a faint yellow, covered with a thin glaze.

6. A slightly flared rim with an expanded lip.

7. A light colored exterior collar (contrasting thicknesses of glaze).

8. Cobalt blue base marks under the glaze. Rice bowls have a square "reign" mark; some cups have simple brush strokes (sun, moon).

Rockingham: A common lead based glaze used on earthenware from the late 18th century. The glaze is mottled dark brown and yellow. (Boger 1971; Barclay 1976).

Salt Glaze: A thin, glassy glaze found exclusively on high fire stoneware. Common table salt is thrown into the kiln during firing. The salt vaporizes and bonds with the stoneware surface to produce an "orange peel" pitted surface. (Norman-Wilcox 1965; Barclay 1976).

Chinese Brown Glaze: A dark brown glaze which may be "semi-matte" chocolate brown or almost an iridescent black-brown color (Chase 1976). Sometimes known as "jian you" or "Tiger" glaze.

Slip: Clay that is mixed with water and applied in liquid form to the ceramic surface (Hughes 1965).

Albany Slip: A dark brown to greenish-black clay slip which was usually applied to the interior surface of salt glaze stoneware vessels common after 1843. It also occurs on vessel exteriors. The slip derives its name from Albany, New York where the dark clay for the slip was primarily found.

White Opaque: (Tin Enamel) A lead glaze popular on Mexican earthenware (Majolica). It is visibly thick in cross section and often has handpainted designs applied on the glaze.

473.6 Decorative Techniques:

Transfer-printing: The process of decorating pottery from paper impressions taken off inked copperplate engravings; an English invention dating from the Buttersea enamel-works (1753-56). (Norman-Wilcox 1965). The design is made of many colored dots, barely visible to the casual observer. Dots are always underglaze in contrast to decal overglaze dots.

Decal: A method of multiple color decoration introduced about 1860. Decal colors will appear in slight relief when light is reflected from the vessel's surface (Berge 1980). The design is composed of hundreds of raised dots, similar to transfer prints, but over the glaze.

Handpainted: Applied by hand with a brush or fingers. Irregular uneven designs are the usual result. Brush marks are clearly visible in most cases.

Molded Relief: Raised decoration which is an integral part of a vessel mold or form; particularly popular on clear glazed white ironstone vessels dating from the second half of the 19th century. (Wetherbee 1974).

Spatter or Sponge: Mottled, colorful designs applied with a sponge or brush. Popular from 1798 to 1865. (Sperry Wood 1959).

Sprigging: Applied relief design usually in the form of small leaves and flowers. (Boger 1971).

Annual/Banded Design: Decorative rings around the exterior rim and base of a vessel, usually in earth tones, applied with a stationary brush and rotating wheel; often called "engine turned". This type of decoration is often seen on yellow ware and pearlware mugs and bowls.

473.7 Pattern Names:

Flow Blue, Flown Blue, Flowing Blue: A ceramic decoration of transfer print variety usually blue, made by adding a volatizing mixture during the glaze firing, causing a softened effect. Popular between 1825-1862, flow blue also appears in other colors including green, brown, red, etc.

Gaudy Dutch/Gaudywelch: A pattern style popular between 1810 and 1930. The design generally consists of handpainted stylized flowers in bright colors. It was made to appeal to the cheaper market (Norman-Wilcox 1965). Gaudy Dutch designs have been observed on Ironstone vessels dating from the late 19th century.

Featheredge: A moulded border decoration consisting of a swirled feathery band at the edge of a usually scalloped rim on a plate or bowl. The band is usually colored blue or green in contrast to the white vessel. Featheredge and its variant, "shelledge" were commonly used on creamware, pearlware and other white earthenwares between 1770 to the mid 19th century (Noel-Hume 1976).

Willow Pattern: The best known of all transfer print designs. It is a European imitation of a Chinese blue and white design which depicts a river with a bridge across it and willow trees on the bank. Two birds are supposed to represent two lovers flying away from an irate father. First produced by English potters in 1780, the willow pattern is still used today. (Barclay 1976).

Mocha: A moss like decoration obtained by touching the ground color of a white slip with a brush containing pigment. Popular from 1790 - 1890.

Rebeccah-at-the-Well: A Rockingham glazed molded relief design consisting of a raised figure of a woman drawing water from a well. The design was used almost exclusively on tea pots and originated in 1852.

Delft: Blue decoration on a opaque white tin glaze, similar in technique to Majolica or faience. Delft was an early European attempt at imitating Chinese export porcelain. Popular to 1730, it was produced in England until the early 19th century. (Noel-Hume 1976).

Canton/Canton Ware: A design common to Chinese export porcelain. Along with the variations called "Nanking" were Chinese forerunners of the Willow pattern. The design is handpainted blue on white underglaze and includes a central pictorial theme of a bridge, teahouse, birds and willow tree. The design on porcelain reached its height of popularity in the Euro-American market by 1780. By the first quarter of the 19th century the quality dropped dramatically. (Tindale 1975; Barclay 1976).

Bamboo, Three Circles and Dragonfly, Swatow: The pattern on the outside of these rice bowls has four units: three circles, a dragonfly character, a marsh with five big leaves and a prunis with four wide leaves. These are all arranged counterclockwise. (Chase 1976).

Four Seasons, Four Flowers: The "Four Seasons" pattern is composed of the flowering plant of each of the four seasons painted crudely in overglaze polychrome enamel in the four quadrants: cherry, water lily, peony and chrysanthemum, in clockwise order. (Chace 1976).

473.8 Vessel Forms:

For illustrations of most Euro-American vessel forms see the following pages. For Asian vessel illustrations see next page.

Euro-American Vessels

Common Euro-American Vessel forms from: "Pottery and Porcelain, Knopf Collector's Guides to American Antiques" by William C. Ketchum Jr. (1983), courtesy of Alfred A. Knopf, Inc.Euro-American Vessels

Common Euro-American Vessel forms from: "Pottery and Porcelain, Knopf Collector's Guides to American Antiques" by William C. Ketchum Jr. (1983), courtesy of Alfred A. Knopf, Inc.Euro-American Vessels

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Ceres Pattern on 10 in. milk Fig Pattern on 9 in. teapot, pitcher, 1850 Davenport, 1856

Corn N' Oats Pattern on 8 in. Boote's Octagon Pattern on high sugar bowl, no date 11 in. platter, T.R. Boote, 1851

Common Ironstone Patterns from: "A Handbook on White Ironstone" by Jean Wetherbee (1974), courtesy of Wallace Homestead, Inc.Euro-American Vessels

Davenport's Decagon Pattern on 9 in. diameter, 6 in. high chamber pot, Davenport, 1853

Gothic Pattern on 9 in. wide, 7 in. tall octagonal dish,Davenport, ca. 1840's

Common Ironstone Patterns from: "A Handbook on White Ironstone" by
Jean Wetherbee (1974), courtesy of Wallace Homestead, Inc.Common Chinese Vessel Forms:

Common Chinese Vessel Forms: (from Felton, Lortie, and Schultz 1984; Chace 1976)

473.9 Trademarks:

Maker's marks, patents and other devices that are printed or impressed on ceramic vessels, are usually the most accurate dating indicators. Hallmark motifs, key works and pattern names are often associated with specific time periods e.g., "made in England" implies a post 1900 date. Registry marks, the diamond shaped inscriptions commonly used in England between 1842-83 provide a key to the year, month and day of manufacture. If any numbers, pictures, initials or marks are observed on ceramic artifacts in the field, these should be recorded and an encyclopedia of maker marks should be consulted (e.g., Gates and Ormerod, 1982).

The following list of general rules for interpreting Euro-American maker's marks has been adapted from Godden's Illustrated Encyclopedia of British Potter and Porcelain Marks (1963) and Wetherbee's White Ironstone (1974). For a discussion of Asian maker's marks, see Berge 1980:215-216.

"Any printed mark incorporating the name of the pattern may be regarded as having been made after 1810."

"The use of the work "Royal" suggests a date after the mid-19th century."

"The garter shaped mark was used from 1840 onward."

"The Staffordshire knot occurs from about 1845."

"The Royal Arms was used from the early part of the 19th century, but the quartered shield without a central escutcheon was used after 1837."

By law, the word England has to be affixed to English goods imported to the U.S. after 1891. Some British potters, however, labeled their wares with "England" as early as 1869.

Note: This American law requiring labeling of national origin applied to other ceramic exporting countries.

"Made in England" is a 20th century mark.

Ltd., "Limited," reveals a date after 1860's but was not generally used in ceramics marks before 1880."

"Trade Mark" had to be subsequent to the Trade mark Act of 1862. Normally, it denotes a date after 1875.

473.10 Historic Ceramics

Registry Marks

The following key for interpreting English Registry marks is also adapted from Godden and Wetherbee. (Note: These are not IMACS codes.)

Index to Year and Month Letters:

1842-67
Year Letter at Top

A - 1845	N - 1864
B - 1858	O - 1862
C - 1844	P - 1851
D - 1852	Q - 1866
E - 1855	R - 1861
F - 1847	S - 1849
G - 1863	T - 1867
H - 1843	U - 1848
I - 1846	V - 1850
J - 1854	W - 1865
K - 1857	X - 1842
L - 1856	Y - 1853
M - 1859	Z - 1860

1868-83
Year Letter at Right

A - 1871	L - 1882
C - 1870	P - 1877
D - 1878	S - 1875
E - 1881	U - 1874
F - 1873	V - 1876
H - 1869	W - (Mar. 1-6) 1878
I - 1872	X - 1868
J - 1880	Y - 1879
K - 1883	

Months (Both Periods)

A - December
B - October
C or O - January
D - September
E - May
G - February
H - April
I - July
K - November (and December 1860)
M - June
R - August (and September 1st-19th, 1857)
W - March

Datable Motifs and Registry Marks on Ceramics

Summary of Historic Ceramic Tableware in Western Archaeological Sites

by Sarah Johnston

-1500

Typical Trademarks

English Delftware/Majolica
Paste: Buff to Red-Brown, Porous
Glaze: Opaque white lead with tin oxide
Deco: Handpainted Blue on White Polychrome

Chinese Export Porcelain
Paste: Fine Blue-White
Vitrified, Translucent

Chinese "Chop" Marks

-1600

Glaze: Clear with blue tint
Deco: Handpainted
Blue on White (Nanking, Canton)
Polychrome (Famille Verte, Famille Rose, Lowestoft, Rose Medallion)

-1700

1730 - Delftware loses popularity

-1800

Decline in Quality of Export Wares

European White Earthenware
Paste: Fine White or Creamy White, Porous
Glaze: Clear Lead
Deco: Transfer Print (Willow, Landscape Scenes)

Staffordshire England

Decline in popularity and availabilty of Chinese Export Porcelain

-1840

Beginning of Ironstone Era
Paste: Fine White
Glaze: Clear non-Lead
Deco: Molded-Relief

1850

Overseas Chinese Pottery
"Reign marks" "Sun/Moon" Characters
Paste: Fine Blue-White
Translucent also Stoneware
Glaze: Clear or Celadon

East Liverpool Ohio

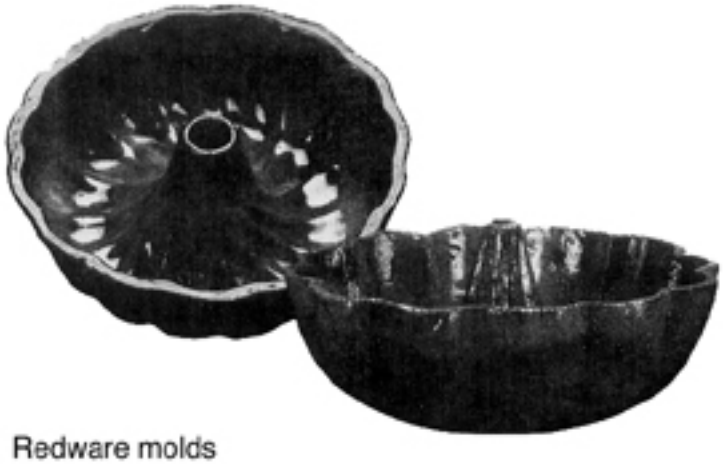
-1900

End of Ironstone Era

American White Earthenware
Paste: Fine White or Grey-White, Vitreous China, "Semi-Porcelain"
Glaze: Clear
Deco: Decal Floral orPinstripe

Deco: Handpainted
Blue on White (Double Happiness, Bamboo, Swatow)
Polychrome (Four Seasons)

Euro-American Vessels



Redware molds
Eastern US c. 1800-60. Left H: 3-4";
D: 8-9". Right, H: 3 1/2-4 1/2"; D: 8-10"

Rockingham spittoon
Yellowware (earthenware) with mottled brown
Rockingham glaze on a molded-relief shell pattern.
Bennington, Vermont c. 1850-70.
H: 3 1/2 - 4"; D: 9-10".

Common Euro-American Vessel forms from: "Pottery, Porcelain, Knop Collector's Guides to American Antiques: by William C. Ketchum Jr. (1983), courtesy of Alfred A. Knopf, Inc. Euro-Ame Vessels.

Euro-American Vessels

Yellowware mug

Decorated with white and black banded slip. US c. 1880-1910. H: 2½-3½"; D: 3-4".

Redware porringer

Sponge decorated, for eating soups, stews, porridge. Eastern US c. 1750-1850. H: 2-3"; D: 3-4½".

Transfer-decorated ironstone cup

Blue "Willow" pattern. Eastern US c. 1900-30 H: 2½-3"; D: 3¾-4".

Transfer-decorated white earthenware plate

Blue "landscape scene". Jersey City, New Jersey c. 1840-1842. D: 9-9½".

Stoneware crock

Note orange peel finish of glaze. Decorated with cobalt blue handpainting. Interior is coated with brown albany slip. Made in Pennsylvania, New Jersey, and Virginia c. 1850-80. H: 16-22"; D: 11-15".

Stoneware ginger beer bottles

Note orange peel finish typical of salt glaze. Interior is glazed with albany slip. Eastern US c. 1850-1900. H: 6-10"; D: 2½-4½".

Rockingham teapot

Molded "Rebeccah-at-the Well" design. Ten sided yellow-ware vessel with mottled brown Rockingham glaze. Eastern US potteries c. 1860-1900. H: 8-10"; D: 6-7".

Porcelain beaker

Hand painted, molded, and gilded. Lenox Inc., Trenton, New Jersey c. 1920. Popular style c. 1870-1930. H: 3-4"; D: 2¾-3".

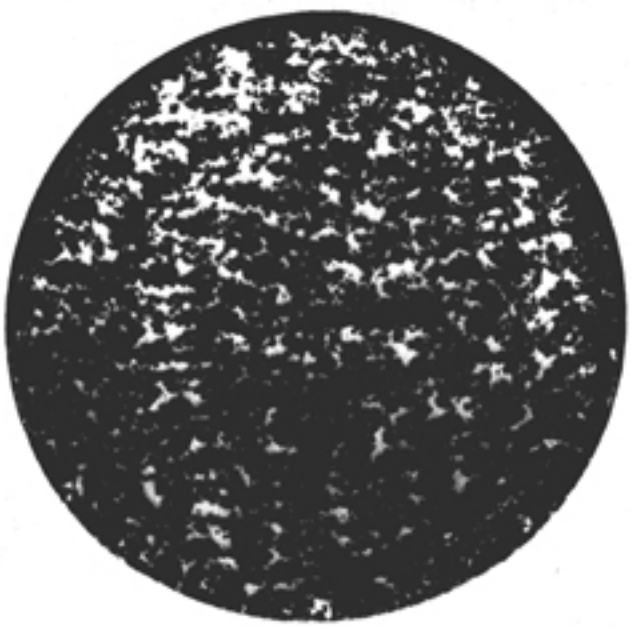
Common Euro-American Vessel forms from: "Pottery and Porcelain, Knopf Collector's Guides to American Antiques" by William C. Ketchum Jr. (1983), courtesy of Alfred A. Knopf, Inc.Euro-American Vessels

Redware sgraffito plate

Incised decoration through cream-colored slip. Pennsylvania. D: 11-13".

Spatterware plate

White earthenware with spatter blue decoration. Spatter decoration is more concise than Sponge and often has large open areas within the design. England c. 1840-80. D: 9-11".



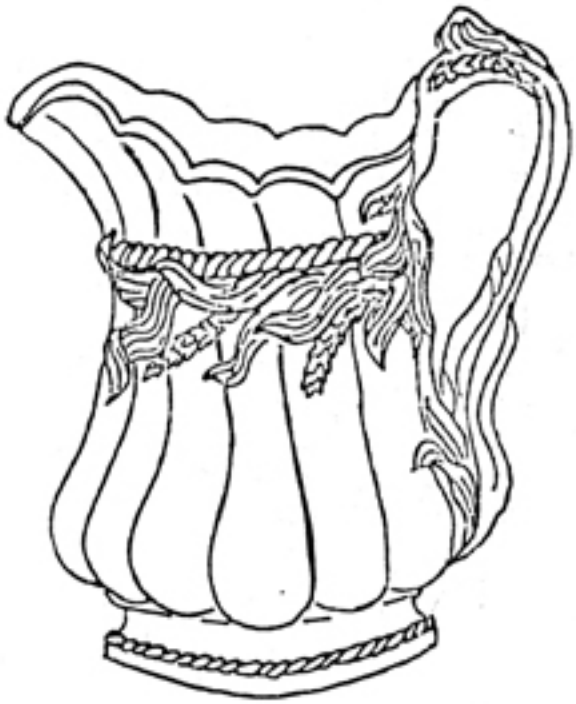
Spongeware plate

Ironstone (white earthenware) with mottled blue sponge design. England, also New Jersey and Ohio c. 1860-90. D: 9-10½".

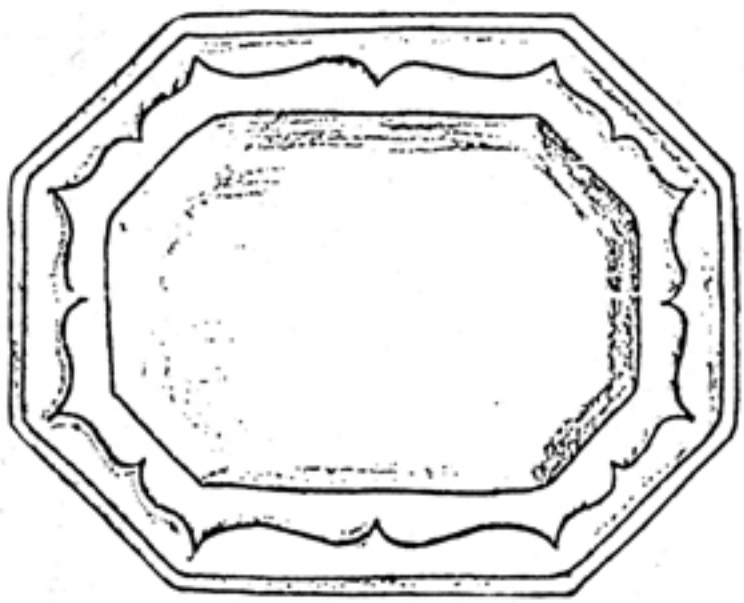
Yellowware bowl

Blue Mocha Design, mocha design probably applied by sponge, unlike finer English Mocha designs created by touching a brush with pigment to a wet white background. Various US potteries c. 1870-1910. H: 5-7"; D: 6-10".

Common Euro-American Vessel forms from: "Pottery and Porcelain, Knopf Collector's Guides to American Antiques" by William C. Ketchum Jr. (1983), courtesy of Alfred A. Knopf, Inc,Euro-American Vessels

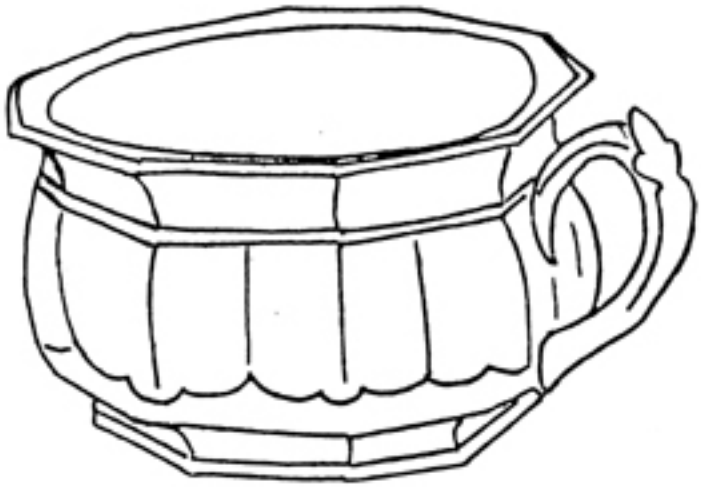


Ceres Pattern on 10 in. milk Fig Pattern on 9 in. teapot,pitcher, 1850 Davenport, 1856



Corn N' Oats Pattern on 8 in. Boote's Octagon Pattern on high sugar bowl, no date 11 in. platter, T.R. Boote, 1851

Common Ironstone Patterns from: "A Handbook on White Ironstone" by Jean Wetherbee (1974), courtesy of Wallace Homestead, Inc.Euro-American Vessels



Davenport's Decagon Pattern on 9 in. diameter, 6 in. high chamber pot, Davenport, 1853

Gothic Pattern on 9 in. wide, 7 in. tall octagonal dish,Davenport, ca. 1840's

Common Ironstone Patterns from: "A Handbook on White Ironstone" by
Jean Wetherbee (1974), courtesy of Wallace Homestead, Inc.Common Chinese Vessel Forms:

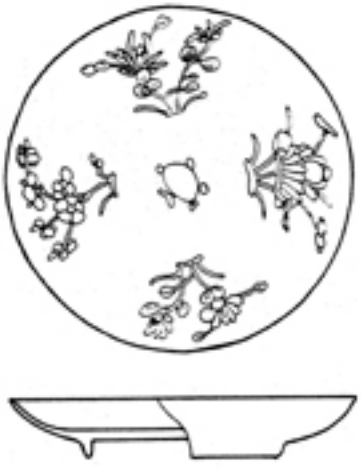
Common Chinese Vessel Forms: (from Felton, Lortie, and Schultz 1984; Chace 1976)

Wine/Tiger Whiskey

Soy Sauce

Shouldered Food Jar

Double Happiness/Swirl

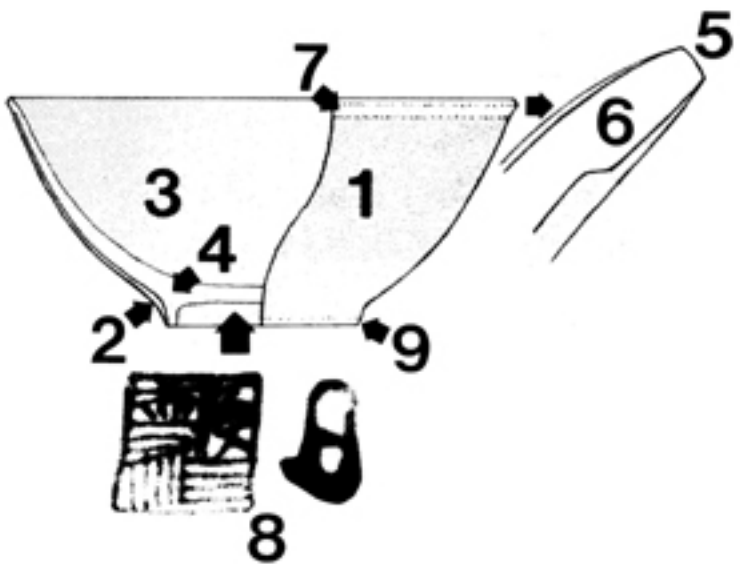


Four Seasons

Bamboo/Swatow/
Three Circles and Dragonfly

Common Chinese Vessel Forms: (from Felton, Lortie, and Schultz 1984; Chace 1976)

Characteristics of Celadon Wares (From Wylie and Geer 1983)
rice bowls, tea/wine cups, spoons



See text for explanation

Three Typical Opium Pipe Bowl Types
(From Wylie and Fike 1985)

orange
66-79mm. diam.

grey-green or
dark reddish brown
65-68mm. diam.

grey-green
60-70mm. diam.

474 - CARTRIDGES

474.1 IMACS Classification:

(AM) Ammunition
(AW) Ammunition with maker's marks

474.2 Cartridges and Dating: "A wealth of information on dates of cartridges occurs and is very useful. Only the initial dates of cartridges and guns are useful (when present), however, since guns were used for many years after their original purchases. Cartridges are discrete sources of information of bewildering complexities, part of which is related to 'wild cat' (off-brand or modified cartridges) and to great varieties in cartridges which have been available. One factor to be considered is reloading of centerfire cartridges which has been very common. Rimfire cartridges, conversely, are not normally reloaded (Barnes 1972:271). Both rimfire and centerfire cartridges owe their mass produced geneses to between 1856 and 1858 (although they had been produced earlier in very limited amounts), according to Barnes (1972:69 and 271). Standard centerfire cartridges with self-contained primers were innovations of approximately 1868 mass productions and continue to the present" (Buckles et al. 1978:445-446).

"Most cartridge identifications must be made from measurements, as few had identifying head stamps. For identification purposes we refer to Cartridges of the World (Barnes 1972), American Centerfire Cartridges, 1892-1963 (Bearse 1966) and Cartridges - A Pictorial Digest of Small Arms Ammunition (Logan, 1959). Unidentifiable cartridges can be referred to local gunsmiths who are often eager to aid" (Buckles et al. 1978:430).

"Cartridges, or rather metallic cartridge cases, are usually prevalent in southwestern historical sites, particularly those of the nineteenth century. The headstamp markings provide a convenient means of dating the cases" (Berge 1980:219).

"The flat part of the head is usually stamped with the caliber type, manufacturer's name or initials, and sometimes trade names American military cartridge case heads usually have the initials of the arsenal or ordinance plant where manufactured, plus the last two numbers of the year the particular cartridge was made. For example, a head stamp that reads 'F 87 R 3' indicates that the case was made at the Frankford Arsenal (F) in March (3), 1887 (87) for a rifle (R)" (Berge 1980:223).

Logan (1959:189-192 and 204) identifies the following manufacturers of headstamps found in the southwest: (Berge 1980:223-224)

DM	Des Moines Ordinance Plant
DWM	Deutsche Waffen & Munitions Fabriken (Germany)
F; F.A.	Frankford Arsenal (U.S.)
F. (impressed)	Federal Cartridge Co. (rimfire cartridge cases)
F.V.V. & Co.	Fitch, Van Vechten & Co., New York City.G. Jacob Goldmark, New York (Metallics)

H.	Winchester Repeating Arms (rimfire cartridge cases). In 1866, the New Haven Arms Co. was reorganized into Winchester (1867-present).
H. (raised)	Winchester Repeating Arms (rimfire--early manufacturing).
P. (raised)	Phoenix Cartridge Co.
P. (impressed)	Peters Cartridge Co. (1887-1934 absorbed by Remington).
PC CO.; PETERS	Peters Cartridge Co.
RA: RaUMC; REM-UMC	Remington Union Metallic Cartridge Co. (1902-present).
RW	Winchester Repeating Arms Co. (rifle).
U;UMC	Union Metallic Cartridge Co. (before the merger with Remington--1867-1902).
U	Utah Ordnance Plant
U HiSpeed	Remington UMC (on rimfires since WWII)
U.S.; USC Co.	United States Cartridge Co. (1868-?)
US (raised)	United States Cartridge Co. early.
US	United States Cartridge Co. (intertwined like a $ sign).
WRA: WRA CO; Super Speed	Winchester Repeating Arms Co.
W; W Co.; WCC; WESTERN Super-X	Western Cartridge Co. (1898-present).
1901 NEW RIVAL; 1901 LEADER; 1901 REPEATER; 1901 PIGEON	Winchester Repeating Arms Co.

474.3 Pertinent Notes for Recording Cartridges:

If cartridge cases are observed with a stamp on the flat part of the head, then these markings (i.e., stamps) should be described and drawn. These stamps can then be identified upon return to the laboratory by comparison with various references (especially those noted in this section). Dating of cartridge cases is based on the time length of manufacture by a specific company (e.g., Peters Cartridge Co. (1887-1934), or upon the date on the cartridge case. If the observed cartridge cases do not have stamped heads, then general dates can be ascribed from the technique of manufacture. The development of the various cartridge types is outlined in Berge (1980).

474.4 Measurement of Cartridge Calibers:

"The Americans and British measure the cartridge caliber in 100th's or 1000th's of an inch, the caliber being designated by any one of the following criteria (Bearse 1966:15):

1) Bore or diameter of the barrel.
2) Barrel-groove diameter.
3) Bullet diameter.
4) Inside diameter of cartridge case mouth.
5) Arbitrary figure, determined by manufacturer.

The caliber may be designated by many means, as listed, and may include the case length or case type. The measuring of a cartridge case with calibers in order to determine specific measurements of given places on the metallic case may prove to be of more value than cartridge-type collections. Many books such as Barnes (1965) give detailed listings of cartridge case measurements which identify a cartridge case very accurately" (Berge 1978).

475 - BUTTONS

475.1 IMACS Classification: Buttons should be encoded under the entry (BU) Buttons or (BW) Buttons with maker's marks.

475.2 Button Chronology and Dating: In general, "Europe furnished most of the buttons until almost the nineteenth century. Here and there, records show that a few were made in this country--in New England as early as 1706; in Philadelphia in 1750. Joseph Hopkins made silver buttons in Waterbury, Connecticut, in 1753. A 1770 advertisement announced that Benjamin Randolph was making buttons of apple, holly and laurel wood. By that same year, the three Grilley brothers had opened a shop in Waterbury, Connecticut, for the manufacture of pewter buttons, and invented a method including the wire shank. In 1774, the congress of Massachusetts recommended using papier-mache buttons to reduce imports from the mother country. During this entire period, both horn and pewter buttons were being made in homes, and peddlers were carrying them afar for sale. By the first quarter of the nineteenth century, buttons were being manufactured everywhere. England, France, Germany and the United States were in constant competition, especially in the manufacture of metal dress and uniform buttons. Because each country utilized its natural resources and its own craftsmen, materials and techniques varied" (Luscomb 1967:ix).

Buttons can be roughly dated according to initial dates of industrial innovations and material type. For chronology associated with material type see section 475.3. For chronology associated with shank styles see section 475.4. However, the best means of dating buttons corresponds to the presence of makers marks, quality marks and registry marks. These categories are defined below.

Back Mark (Maker's Mark): "A term used for any stamping found on the back of buttons: words denoting quality, such as Extra Rich or Superfine; manufacturers' names; uniform makers; stars, dots, eagles. The name of a known maker and recorded facts regarding his business career can be associated with contemporary activities and events to determine with reasonable accuracy just when a specific item was produced, and for what purpose. Even the lack of a back mark will often establish the period of use, since it was not until the early 1800s that button makers began to stamp firm names, trademarks, and other devices on backs. But there are exceptions to the helpfulness of back marks; sometimes the makers names have been spelled incorrectly, or a motto does not seem to be related to the face die" (Luscomb 1967:17-18).

Quality Mark's: "A term used for certain words found on the backs of buttons made after 1800. It is believed the purpose of the words was mainly to promote sales, as the differences in quality can seldom be noted. Most of the marks appeared between 1800 and 1850. Examples are "Rich Gold", "Gilt", and "Rich Orange" (Luscomb 1967:163).

Registry Mark's: "Marks found on the backs of British-made buttons. They have been found on ceramic, glass, horn, and metal buttons. A registry mark is diamond-shaped, with letters or numbers at the points of the diamond. At the top point is an extra circle with a letter. The letters and numbers indicated the material, month, day, and year the button design was registered, and bundle inspected (Luscomb 1967:166).

A compilation of button makers and outfitters of American origin that includes approximate dates of manufacture and also type of button produced can be found in The Complete Button Book (Albert and Kent 1949). It is an initial attempt to compile such a list and as such is only a partial one. Information of manufacturers not included in this listing can be obtained from local city directories of past years.

475.3 Material types of Buttons:

Abalone:	See "shell"
Agate:	Moss agate or chalcedony, cut and polished in various shapes, has long been used to make buttons. Agate disks were available in the 1900 Sears catalog.
Aluminum:	In the later nineteenth century, aluminum buttons were more costly than silver or gold. They were produced in one or two pieces and stamped with delicate designs. Aluminum was also used in the 1940's and 1950's, particularly for stamped uniform buttons.
Bakelite:	This is a synthetic plastic invented in the United States between 1907 and 1909. Bakelite buttons were produced until about 1930 when other plastics were developed, the buttons were plain, drab colors and the word "Bakelite" was molded on the back.
Bone:	Disks cut from animal bones have been made in a variety of sizes from prehistoric times. They are usually sew-thru types with from two to five holes, although some with metal rims and shanks have also been made. Since 1850, carved and inlaid bone buttons have also been made. Bone buttons are made only rarely now but are more common on sites predating 1850.
Brass:	Probably the most common button material, brass has been used in the United States since the 1800's for men's clothing and uniforms. From 1800 to about 1860, one-piece buttons were made; after about 1860 two-piece buttons were made.
Calico:	One type of china button made in the United States between 1848 and 1865 and decorated with tiny calico transfer designs, (see Prosser).

Celluloid: This synthetic, ivory-like material was developed in 1869. Celluloid is distinguished from ivory by a carbolic or menthol odor produced by heating or rubbing the surface of the button. After 1900, a two-piece button was made by placing a thin piece of celluloid over another type of material.

China: See Prosser.

Daguerreotype: During the Civil War (1860 - 1865), daguerreotype photographs were used on two piece buttons with glass fronts and backs.

Ferrotypes or Tintypes: Developed during the Civil War, ferrotype photographs were also made into buttons. They do not have the "Coppery" finish found on daguerreotype photos.

Glass: Many different types of blown, molded, and fused glass have long been used for buttons. Glass has been used for all types of button construction, and a great range of colors are known. Luscomb (1967:80-89) discusses over twenty-five different kinds of glass buttons. Prosser buttons are often confused with glass. Be careful not to confuse glass with ceramic or so-called little chinas made by the Prosser process (Roderick Sprague, personal communication 1985).

Horn: Disks, metal shank and self-shank buttons cut from horns and antlers of animals were made in the United States and Europe. In the 19th century, horn was sometimes processed (or imitation horn was made) and stamped with intricate designs.

Ivory: Elephant tusks, the teeth of whales, and tusks of the walrus and hippopotamus were used for "ivory" buttons. Ivory can be distinguished from celluloid by fine-grained striations which are characteristic of the structure of teeth and tusks.

Japanning: This is a lacquering process developed in Europe about 1800. Tin, wood, brass or other materials were coated with successive layers of high grade varnish. Black was the most common color for japanned buttons. The term "lacquered" refers only to those varnished buttons produced in the Orient.

Mother-of-Pearl: See "Shell".

Pewter: Pewter buttons with wedge and wire shanks were cast in the late 18th and early 19th century for use on men's clothing. After 1800, a pewter button with an iron shank was made. Luscomb (1947:148) lists the names of 21 pewterers whose names appeared on pewter buttons in the early 1800's. After 1810, many pewterers switched to brass. Pewter buttons, painted and decorated with other materials, were manufactured in the late 19th century.

Plastic: The manufacture of synthetic plastic buttons expanded after 1930. In the 1940's, it was common to trim and inlay other materials into a plastic button body.

Porcelain: Porcelain buttons were manufactured in several styles between 1850 and 1920. Hand painted floral designs were popular between 1900 and 1920. Technically porcelain should include Prosser or china buttons but traditionally it has excluded this type.

Prosser: Patented in 1849, the process is one combining high fired clays to produce a glass or vitrified appearance. The most common varieties are black, white, or calico having an appearance of opaque pressed glass. The backs have a pebbled or orange-peel surface (Sprague 1983:167-172).

Rubber: Between 1849 and 1851, Nelson Goodyear patented and improved the manufacture of hard rubber. Often the name "Goodyear" and the dates "1849-1851" are molded on the backs of hard rubber buttons. These markings refer to the dates of the material patents, not the manufacture date of the buttons. Most buttons were black, or occasionally reddish brown, and ranged from 1/4 to 2 inches in diameter. Geometric designs or concentric rings were molded more often than any other designs. Rubber buttons were also made by the Indian Rubber Company before 1880-1890's. Novelty Rubber Co. (N.R.Co.) was a manufacturer from 1855 to 1870.

Shell: Because the inner layers of many types of shells are similar, it is difficult to classify buttons according to the types of shells from which they were cut. In the factory, shells are sorted by color, regardless of species. Fresh water shells are not as iridescent or brilliant as deepwater species. In the United States, fresh water shells are used for utilitarian buttons. It is difficult to date shell buttons with certainty because of the long history of shell as a button material. All types of holes, shanks, shapes, decorations and sizes are used for shell buttons (Luscomb 1967:177-180). Smooth backs generally postdate 1900. Intricate carved designs and cameos generally predate 1880. Commercially-made shell buttons were introduced into the United States from France in 1855 (Fontana and Greenleaf 1962:98).

Materials	Dating Range
"Bakelite" Plastic	Post - 1907 - Pre 1940
Brass - Uniform Buttons	Post - 1802
Calico - Porcelain	1848 - 1856
Celluloid 1869 - 1920	
Daguerreotypes	1860 - 1865
Ferrotypes	1860 - 1900
Plastic - Synthetic	Post - 1930
Porcelain	1850 - 1920

Rubber	Post - 1849
Shell	Post - 1855

The book Antique Buttons (Peacock 1972) was found to be very valuable for classifications. The book placed buttons into four groups based on size. They are diminutive (0-15 linges), small (15-30 linges), medium (30-40 linges) and large (over 40 linges)"
(Buckles et al. 1978:430-431).

475.4 Button Measurement:

Button size is expressed in lines (or "linges"). Forty lines equal one inch diameter. The following scale was used by Sears Roebuck and Co. in 1908 to correlate lines and inches:

Lines	12	14	16	18	20	22	24
Inches	1/4	5/16	3/8	7/16	1/2	9/16	5/8

Shirt and dress buttons are usually smaller than coat and jacket buttons. The 1908 Sears catalog refers to shirt and dress buttons as lines 10 to 20. Vest, coat and jacket buttons are sized 24 to 36.

475.4 - Button Shanks

See ILLUSTRATIONS section.

475.4 - Button Shanks

This figure illustrates different shank styles found on buttons made between 1700 and the present. Many different construction techniques, used in making one and two piece buttons, are also illustrated.

1700 - 1765  Wedge shank; cast button	1700 - 1790  Gut loop shank	1760 - 1790  Cast white metal loop shank	 Box type shank; cast button
1760 - 1785  Cone shank	1750 - 1812  One piece button and shank	1812 - 1830  Two piece metal button	 Cut shank
1785 - 1800  Alpha loop shank	1812 - 1820  Omega loop shank	1830 - present  Two piece button Sander's type	 Cloth shank
1750 - 1830  Bone button center turned	1800 - 1860  One piece cast metal	post - 1870  Two piece; pressed metal	 Key shank JW

Adopted from Olsen (1963) *

*Olsen, Stanley J.
1963 Dating early plain buttons by their form. American Antiquity, Vol. 28(4).

476 - Shoes

476.1 IMACS Classification:
(AS) Animal shoes
(SO) Shoes

476.2 Shoe History and Dating: "The old way of doing things in the shoe making business meant using wooden pegs, hand driven, to join soles and uppers. Shoes in the western world were universally made this way until the early 1800s. About 1810, and after Brunel's work with clamping presses, an American developed a similar invention as did two Frenchmen, Gengembre and Joliciere, working in Paris. Their efforts were followed in 1822 by a German shoemaker from Stuttgart, a man named Brecht, who conceived the use of screws for joining soles and uppers. Brecht's idea culminated before 1880 in a process in which a thread was cut upon a brass 'cable screw' wire. The screw thus made was then forced through sole and upper placed on an arm beneath, riveted, and then cut off. This was repeated as the shoe was advanced by the workman until the operation was finished, the whole being effected automatically by a single machine. The ends of the wires were then cut off and filed down, and the heels were nailed to the shoes by machinery (Knight 1882:III: 2158, 2162; Turner 1948:138)" (Fontana et al. 1962:105-106).

"As a rule of thumb, one can safely say that it was about 1812 before shoe nails replaced wooden pegs. Shoe-nailing machines, such as that finally perfected by Nathaniel Leonard of Merrimac, Massachusetts in 1829, did not drive finished nails into shoes. Rather they drove wire which the machines then cut and subsequently, in some instances, headed. In other words, the presence of actual square cut iron nails or square cut brass nails in a shoe dates it post-1812. Metal fasteners of any kind, especially wire, in a shoe date it certainly post-1800 and most likely post-1829" (Fontana et al. 1962:105-106).

"Sometime between the 1800s and the present day brass shoe pegs and nails ceased to be made. We have not been able to establish any dates. Modern shoe nails, both wire and square cut, are iron, coated or otherwise treated to make them resistant to corrosion. There are many kinds, but among the more common varieties are the square cut clinch and soling nails; the wire top-lift and hold-fast nails; and the twisted wire fed into a machine from a spool to be cut at any desired length after it has been driven into the shoe. This machine is a descendant of that invented by Brunel at the onset of the 19th century and perfected by Leonard in 1829" (Fontana et al. 1962:105-106).

The following summary is from Anderson (1968:62-64).

During the industrialization of the nineteenth century a number of important technological innovations took place within the shoe industry. Each development was marked by some distinctive feature which provides the archaeologist with valuable technological data. The twentieth century has been a period of stylistic experimentation and innovation, but today's shoes are manufactured by the same methods used in 1912 and are processed by the same types of machines.

There are two basic types of shoes: turned shoes and shoes whose upper is attached to the insole and reinforced by the outsole and heel. The upper of a turned shoe is sewn inside out to a single, thin sole. Then it is turned right side out. Today turned shoe manufacture has generally been replaced by the cementing process, but archaeologically this form abounds and can be easily recognized. The single sole has a thin, feathered strip of leather on the inside of the sole. The upper is stitched to this strip when inside out.

Any mass-produced shoe can be further placed into one of three groups based on the method of attaching the outsole to the upper. A shoe is nailed (or pegged or screwed), sewn, or cemented. Even fragmentary pieces of sole leather generally betray the method of manufacture. Nails may still be intact, or their corroded remains visible in a nailed shoe. If the nails are gone, the round hole remains. There are no channels, feathered ridges or ribs. Thread from a stitched shoe will probably be gone, but small needle holes will remain. These are generally much smaller than those left in nailed shoes and are slightly oval. There may be indentations in the leather between the holes, indicating tightly pulled thread. Sewn shoes will have an outsole channel where the stitching occurs to keep the thread from being worn. They may also have a feathered edge on the bottom of the outsole with the stitching underneath. Feathering was a method used around the turn of the century for protecting stitches from wear. Often this feathering is worn off at the ball of the outsole, but will still be present on the shank. A McKay shoe will have stitching on the inside of the insole. If the stitching does not include the toe and heel, it may be dated before McKay's 1862 patent. Goodyear Welt shoes are recognized by the unique rib on the underside of the insole. Cemented shoes occur late and are distinguished by the fact that the part of the upper cemented to the insole will be intact. This glued piece may be the only remaining fragment of a cement shoe's upper.

A study of fashions and stylistic changes provides another source of chronological information. However, consideration of styles is outside the scope of this paper. Reports on shoes should utilize the terminology for shoe parts and manufacturing processes that are standard within the shoe industry. Primary sources, including shoe manufacturers' guides, trade catalogues, and patent records should always be consulted. Archaeological and other reports have relied on secondary sources containing factual errors which are perpetuated in the literature.

Footwear can be dated by technology alone. Archaeologists working in post-1850 sites need to be aware of the information that can be derived from old shoes.

"Innovations in the shoe making industry have been cited by Anderson (1968) and include some easily identifiable and datable changes. Foremost in importances, we have discovered, were the developments of the 'Goodyear Welt' technique of shoe manufacture in 1875 and the all rubber heel, an innovation of 1895" (Buckles et al. 1978a:445, 448).

476.3 Shoe Chronologies:

1. Chronological summary from Fontana et al. (1962) and Buckles et al. (1978):

Circa Pre-1812 - Wooden pegs, hand driven, to join sole and uppers.
Circa Post-1812 - Wood pegs replaced by square cut iron or brass nails.
Circa Post-1829 - Metal fasteners of any kind, especially wire.
Post-1875 - Goodyear Welt construction.
Post-1895 - All rubber heel.

2. Shoe Chronology taken from Berge (1980:275-278):

The styles of shoes have changed through time as clothes fashions have changed, but not as drastically as in our own time (Wilson 1969:1).

Anderson (1968) presents an outline of shoe improvements during the nineteenth century. It is further listed with some additions (Wohl Shoe Company) as follows:

until 1750	Shoemakers worked in their own homes, hand crafting footwear.
1800	Shoes were made ready-to-wear. Patent leather was introduced.
1812	Shoe nails were manufactured in New England to replace the wooden peg; also the lathe was developed.
1844	Charles Goodyear discovered and patented the process of vulcanization, which included the manufacture of rubber shoes, soles and fishing boots.
1846	Elias Howe, Jr., patented a sewing machine, making it possible to stitch shoe uppers rapidly.
1850s	The first sport shoes were manufactured with a laced fabric top and a rubber sole, later to be called the 'sneaker'.
1860	Lyman R. Blake, Abington, Massachusetts, patented a sewing machine that sewed the sole to the upper shoe. It "left a loop stitch and ridge of thread on the foot side of the insole, and did not stitch the heel or the toe".
--------	Lasts were developed to distinguish between right and left shoes.

1862	Colonel Gordon McKay patented improvements on Blake's sewing machine, which enabled the seams to be made completely around the shoe. This invention lightened shoe construction, eliminating pegs or nails. This machine left stitching on the foot side of the insole.
--------	Eugene Lemercier formed a screw from a continuous brass wire, forced it into the leather, and cut it off automatically.
1874	The eyelet-setting machine was developed.
1875	Charles Goodyear, Jr., perfected the Goodyear Welt Stitcher, which used a curved needle to stitch the welt to the upper shoe and to the sole at the same time.
1888	Standard shoe sizes were developed.
ca. 1912	Manufacturing techniques were standardized: Goodyear Welt, McKay, turned, standard screw, and nailed.
1915	Saddle shoes were first worn.
1926	Cement shoe production by gluing of the sole to the upper shoe.
1937	Wedged soles were introduced.

476.4 Shoe Illustrations (from Anderson 1968)

See ILLUSTRATIONS section.

476.5 Animal Shoes: The following information is adapted from Berge (1980).

Horseshoes

"The normal horseshoe has the form of a constricted arc with the same three general sections as the foot, ie., toe, quarter, and the heel. The area from the toe to the heel on each side of the shoe is termed the branch or wing (Great Britain 1908:227). These branches can be either inner or outer, depending on the position of the shoe in relation to the body median. The area of the shoe which comes in contact with the ground is the ground surface, and the opposite side is the hoof-surface. That portion of the shoe which comes into direct contact with the hoof is the bearing-surface. The fuller is a groove which usually extends the length of the quarter but may include the entire arc of the shoe, from heel to heel. Nail holes are punched into the fuller, and this groove prevents the wearing away of the nail head, thereby preventing the untimely loss of the shoe. The fuller also prevents slipping and aids the farrier in punching the nail holes more easily and accurately (Fitzwygram 1903:479). Seating is used to take the pressure off the sole in order for the wall to take the entire pressure of the horse's weight. The "web" of the shoe (width of the branch) is "the whole of the substance of the shoe ... and the width of the web, cover, e.g., a wide-webbed shoe, is frequently spoken of as having 'plenty of cover' (Great Britain 1908:227).

Normal front shoes are easily distinguishable from normal hind shoes. The front shoes are more nearly circular at the toe and quarter, and are usually wider at the heels. The hind shoes are more pointed at the toe and quarters, and usually narrower at the heels (Hayes 1960:448).

Mule Shoes

"The structure and characteristics of the hooves of these animals are quite similar to those of the horse, differing chiefly in the narrow and the round at the toe, the sole is well-arched, and the side walls are rather steep. In the ass the narrowness of the hoof is still more pronounced, the wall is relatively wide in the region of the quarters. The horn of both the mule and the ass is tough.

The shoes differ from those of the horse in no other respect than that they should be lighter and narrower. Four nail-holes are sufficient for an ass's shoe, and five to six for a mule."

Oxen Shoes

"The shoeing of oxen is essentially different from that of horses, because the foot of the ox is cloven (split), the long pastern, short pastern, and hoof bone are double so that instead of one hoof or claw, there are two upon each foot, distinguished as outer and inner. Each claw consists of wall, sole, and bulbs; the frog is absent. The wall is considerably thinner than that of the horse's hoof, the sole is thin, and the bulbs are low. For these reasons the shoe designed for a claw must be thin, but wide."

Nails

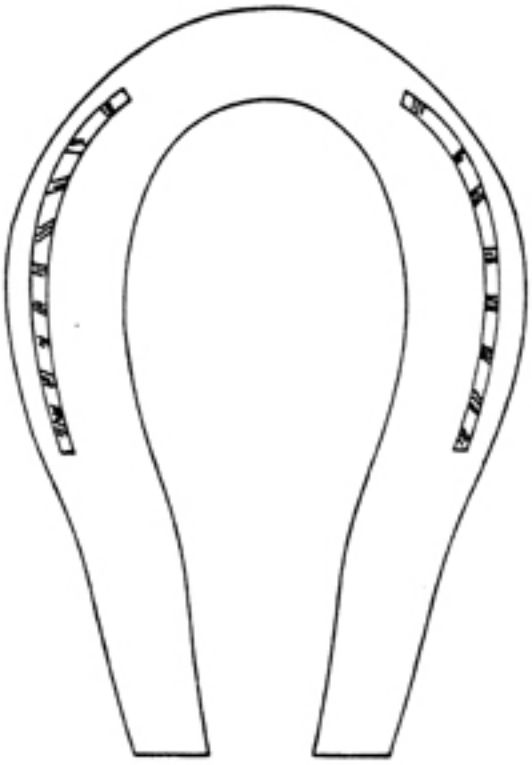
There are hand-made and machine-made horseshoe nails, both of which have their specific advantages and disadvantages (Lungwitz 1908:109). There are two primary types of nails: (1) rose-headed

476.5 - ANIMAL SHOES

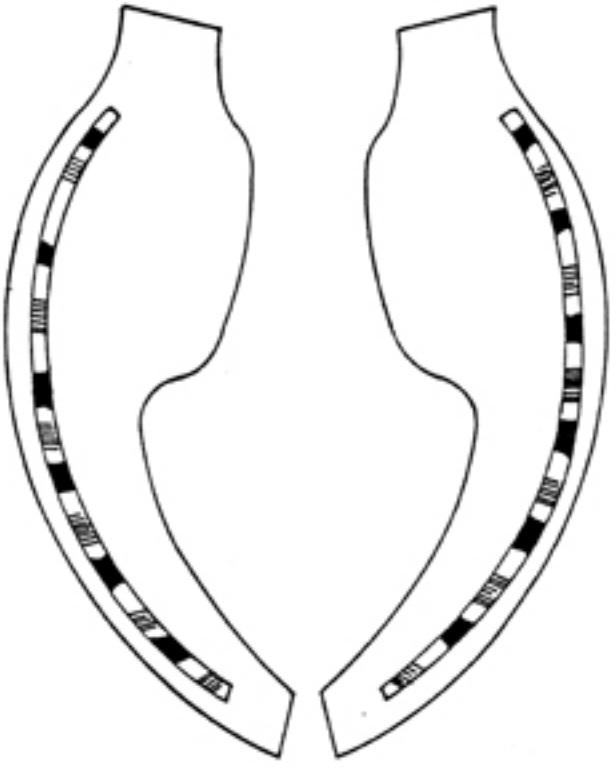
See ILLUSTRATIONS section.

nail and (2) countersunk nails. Rose-headed nails are employed with shoes that have not been fullered; the head does not enter the nail hole. Countersunk nails are embedded into the web, having either a half or full counter (Great Britain 1908:233). There are also frost-nails (edged like a screwdriver) used in the winter to perform the same task as a calk (Lungwitz 1908:119).

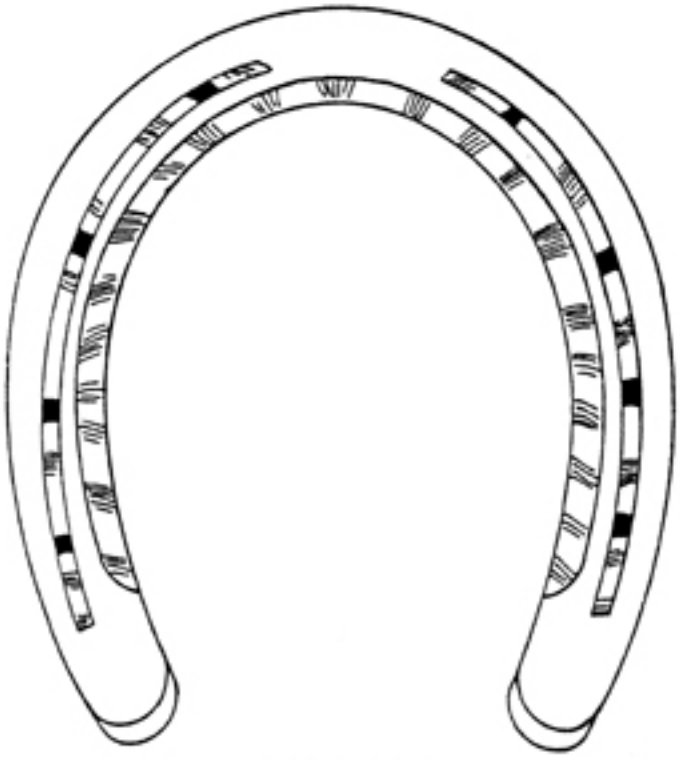
476.5 - ANIMAL SHOES



Mule shoe



Ox shoe



Horseshoe

Horseshoe nails

477 - BARBED WIRE/BALE TIES

477.1 IMACS Classification: Barbed wire should be entered under the encoding entry (WF) Barbed Wire. Bale ties and all other wire should also be entered under the encoding entry (WI) Wire.

477.2 Barbed Wire/Bale Ties and Dating:

Barbed wire and staples are used to contain or repel livestock but may have been primarily used as property boundaries.

"The innovation of the Bessemer steel making process in approximately 1876 had a tremendous effect upon the wire making industry (as well as iron and steel). Due to the lowering of production costs, it allowed for the production of a variety of wire products in large volumes (Clark 1949, Vol. III:124-125). Bale ties and barbed wire were among the products which had a florescence around this time, according to Washburn (1917:154-157). Washburn was an officer of Washburn and Moen Manufacturing Company which acquired most of the patents to the new wire technologies and he was a firsthand witness. Washburn, as an example, cites the first commercially made barbed wire in the United States as consisting of five tons in 1874. In 1876 his company acquired the patents and began production in quantity. A similar florescence in bale ties occurred and Washburn and Moen also held many of these patents. The descendent firm to Washburn and Moen is the United States Steel Corporation and much of its success was related to its wire products.

Wire rope, woven wire fencing, and other wire products were made by Washburn and Moen as the primary supplier. Wire rope became a major product in the 1880s with a major application to cable railways, which were first constructed in 1889 (Washburn 1917:159). Woven wire fencing was popular '...a few years later after barbed wire fluoresced', which would be approximately 1880 (Washburn 1917:163)" (Buckles et al. 1978:444-445).

Chronology: (from Buckles et al. 1978:448)

Post 1875:	Barbed Wire
	Bail Ties
Post 1880s:	Woven Fence Wire
	Wire Rope

"A number of books have been written on the subject of barbed wire (Glover 1969, Clifton 1973, and others). The patents on many variants of barbed wire are definitive but cultural lag is a problem in dating since early wires continued to be used long past their original patent dates" (Buckles et al. 1978:435).

Pertinent Notes on Recording Barbed Wire/Bale Ties:

If barbed wire is present on a site it indicates a date of post-1875. For specific patent dates refer to the references cited above. It should be kept in mind that the patent dates refer only to initial manufacture of that particular type of barbed wire, hence, they may be used to indicate a date no earlier than the patent date. For referencing patent dates, the type of barbed wire (or bale tie) should be drawn and described in the field while recording a site. These drawings can then be compared to the ones accompanying patent dates in various sources.

485 - UTM Instructions

For UTM maps, see the ILLUSTRATIONS section.

UTM MAP LOCATIONS

The Universal Transverse Mercator (UTM) Grid System provides a simple and accurate method of recording locations. It's greatest advantages over other systems are its speed and precision, and the use of simple metric units of measure.

In the UTM system, the Earth is divided into numbered zones (Fig. 1) to determine the correct zone for your area, refer to the lower lefthand corner of your USGS map.

A site's UTM location can be easily calculated if it is plotted on a USGS map that has UTM tick marks along its edge (Fig. 2). Most USGS quadrangles published since 1950, and all published since 1959, have these ticks. Any position can be determined to within 1,000 meters merely by referring to the UTM ticks along the edge of 7.5 or 15 minute maps. More precise locations are determined by using a UTM calculator (Fig. 3).

Any point may be identified by referring to three items: its zone number, its distance in meters north from the Equator ("northing"), and its distance in meters from an imaginary point to the west of the zone ("easting").

Equipment Needed

1. A USGS topographic map, 7.5 minute series (1:24,000) if possible.

2. A flat working surface on which to lay the map.

3. A straightedge long enough to reach completely across the map (30-36 inches). Ordinary rulers may not be straight enough

Figure 3. UTM calculator (fascimile). Arrows indicate the two most commonly used scales.

4. A very sharp pencil.

5. A plastic UTM calculator (enclosed).

Procedure for Calculating UTMs

1. Find your point on the map.

2. With the straightedge, carefully draw a line from the top of the map to the bottom, connecting the two blue UTM ticks immediately west of the point. Make sure the ticks are a correct pair (have the same value).

3. Do the same for the pair of ticks immediately south of the point; draw a line from the left to the right side of the map. This will intersect your first line somewhere to the southwest of the point (Fig. 4).

4. Record the UTM zone number.

Figure 4. USGS map with lines drawn to connect UTM ticks. The lines intersect southwest of the point.

5. Record the easting and northing values of the drawn lines. In our example (Fig. 4), this would be 640___ m. E. and 4987___ m. N. (If this is unclear, see the Notes below.) These are the first digits of your complete UTM location; the last three digits will be measured with the plastic UTM calculator.

6. Find the scale on the UTM calculator which matches the scale on the bottom of your map. The two most common scales are 1:24,000 (7.5 minutes) and 1:62,500 (15 minute).

7. Using the UTM calculator, measure how far east the point is from the north-south line you drew. Record this as the last three digits of the easting value. The point in Figure 5 is 560 meters east of the line. Thus, the complete easting value is 64056 m E.

8. Repeat the process, measuring from the point to the east-west line to obtain the complete northing value.

Figure 5. The UTM calculator shows that this point is 560 meters east of the line, or UTM 640560m E.

Other Methods for Calculating UTM

When a point is located near the lefthand edge of the map, reverse the process. Subtract the values obtained with the UTM calculator from the closest intersecting ticks to the northeast of the point.

Although the basic method will work, other approaches are faster. Refer to the USDI publication "Using the UTM Grid System to Record Historic Sites", HCRS Publication No. 40, by Wilford Cole (1980).

Notes

1. The light blue UTM ticks on the edge of maps may show only their first three or four digits. Easting values are abbreviated as three digit numbers along the top and bottom edges of the map, and the first digit is shorter than the other two. Northing values are abbreviated as four digit numbers along the left and righthand edges of the map, and the first two digits are shorter. These abbreviations are clarified near the northwest and southeast corners of the map, where a tick will be written out in full (Fig. 2). For example, an easting shown as 523 would be printed in full as 523000m E., or 23,000 meters east of the zone's central meridian. (An arbitrary value of 50,000 meters is assigned to the meridian, as a convenience to avoid negative values.)

2 If the value of a UTM tick is not printed on the map, you can easily calculate it by counting from nearby ticks. Just remember that ticks are spaced every 1,000 meters on 7.5 and 15 minute maps, and that you add when counting north or east and subtract when counting south or west.

3. Northing is the number of meters north of the Equator, and has 7 digits. Easting is the distance from an imaginary point 50,000 meters west of the central meridian. Northing values are larger than easting (6 digits) because it is farther to the Equator.

4. Lines connecting UTM grid ticks of equal value are seldom parallel with the edges of the map. Therefore, when drawing lines across your map, be careful to locate the appropriate pair of UTM ticks regardless of how the lines may look.

5. The divisions numbered 1-9 on the 1:24,000 scale of the UTM calculator represent thousands of meters, and the smallest are 20 meters. Thus, the smallest measurable value at this scale is 10 meters, or a point falling between two of the smallest lines.

6. The divisions numbered 1-4 on the 1:62,5000 scale of the UTM calculator represent thousands of meters, and the smallest are measurements may only be made to the nearest 50 meters. Thus, the measurements may only be made to the nearest 25 meters at this scale. (We are not sure why this scale goes beyond 1,000 meters, because you should never need anything more.)

UTM EXERCISE #1

Using the scale for a 7,5 minute map, calculate the UTM Easting and Northing for sites A, B, C, and D. Assume Zone 11. Record your answers in the spaces provided below. The correct UTM values are shown upside-down. (Variation of 10 meters is acceptable.)

UTM EXERCISE #2

Using the scale for a 15 minute map, calculate the UTM Easting and Northing for sites A, B, C, and D. Assume Zone 11. Record your answers in the spaces provided below. The correct UTM values are shown upside-down. (Variation of 25 meters is acceptable.)

485 - UTM Instructions

UTM MAP LOCATIONS

The Universal Transverse Mercator (UTM) Grid System provides a simple and accurate method of recording locations. It's greatest advantages over other systems are its speed and precision, and the use of simple metric units of measure.

In the UTM system, the Earth is divided into numbered zones (Fig. 1) to determine the correct zone for your area, refer to the lower left hand corner of your USGS map.

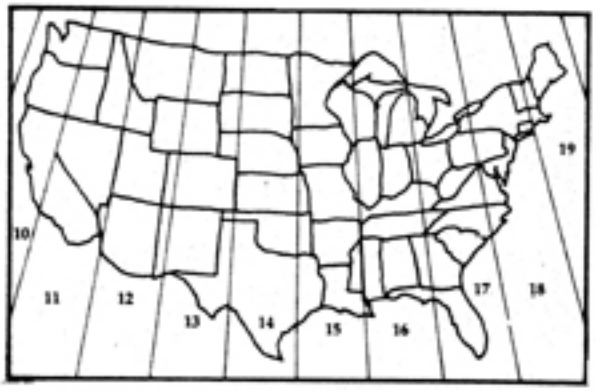


Figure 1. UTM Zones.

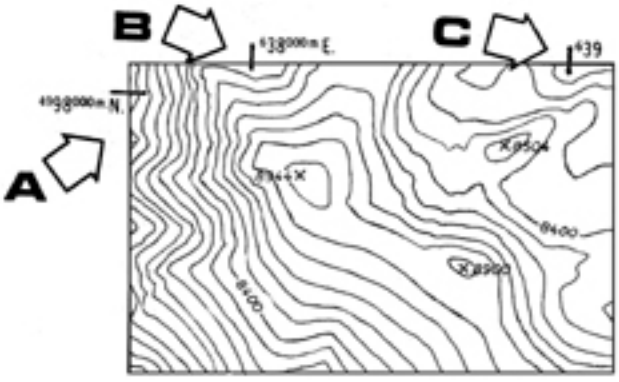


Figure 2. UTM ticks. A - Full Northing; B - Full Easting; C - Abbreviated Easting.

A site's UTM location can be easily calculated if it is plotted on a USGS map that has UTM tick marks along its edge (Fig. 2). Most USGS quadrangles published since 1950, and all published since 1959, have these ticks. Any position can be determined to within 1,000 meters merely by referring to the UTM ticks along the edge of 7.5 or 15 minute maps. More precise locations are determined by using a UTM calculator (Fig. 3).

Any point may be identified by referring to three items: its zone number, its distance in meters north from the Equator ("northing"), and its distance in meters from an imaginary point to the west of the zone ("easting").

Equipment Needed

1. A USGS topographic map, 7.5 minute series (1:24,000) if possible.
2. A flat working surface on which to lay the map.
3. A straightedge long enough to reach completely across the map (30-36 inches). Ordinary rulers may not be straight enough

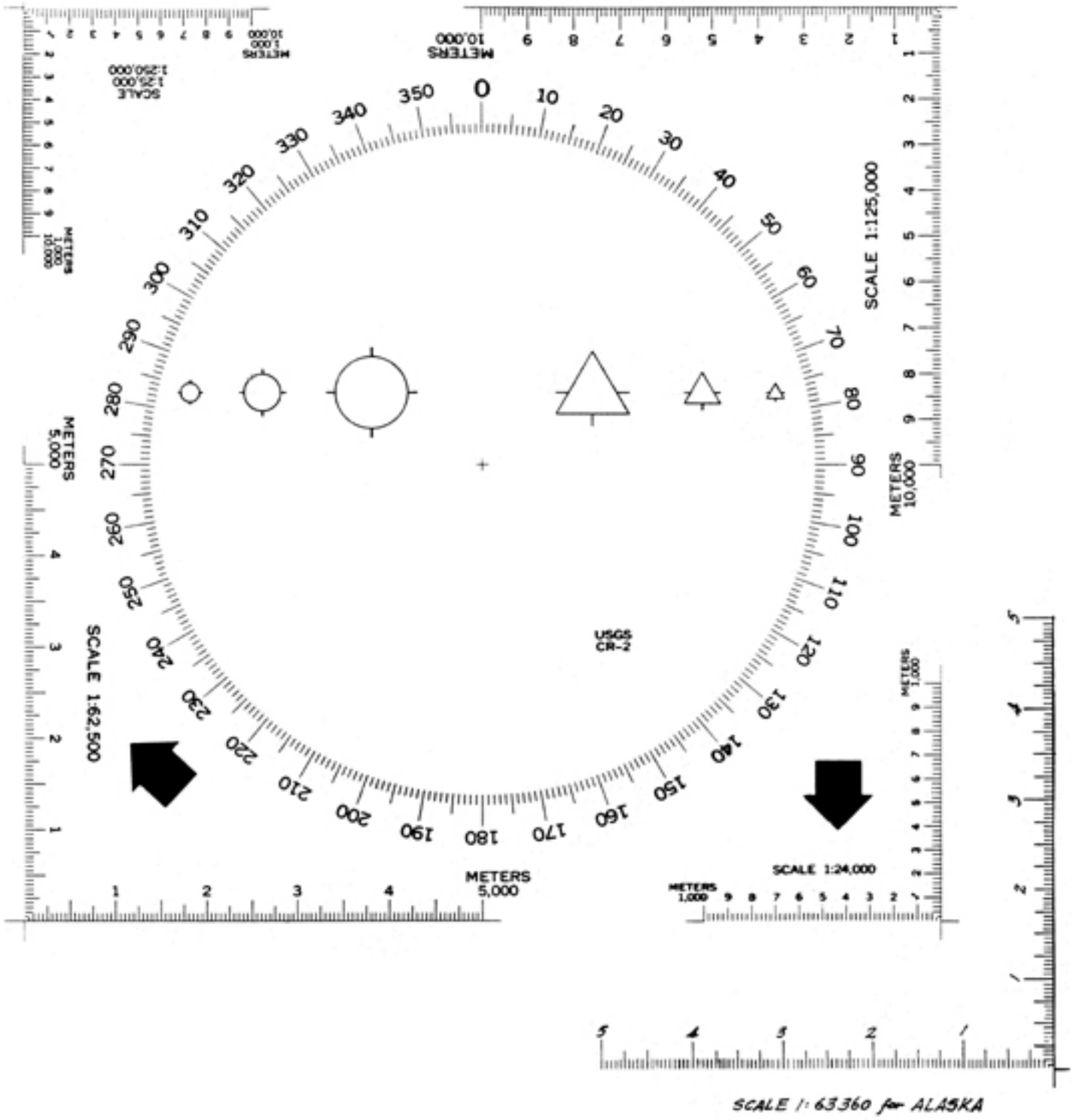


Figure 3. UTM Calculator (facsimile). Arrows indicate the two most commonly-used scales.

4. A very sharp pencil.

5. A plastic UTM calculator (enclosed).

Procedure for Calculating UTMs

1. Find your point on the map.

2. With the straightedge, carefully draw a line from the top of the map to the bottom, connecting the two blue UTM ticks immediately west of the point. Make sure the ticks are a correct pair (have the same value).

3. Do the same for the pair of ticks immediately south of the point; draw a line from the left to the right side of the map. This will intersect your first line somewhere to the southwest of the point (Fig. 4).

4. Record the UTM zone number.

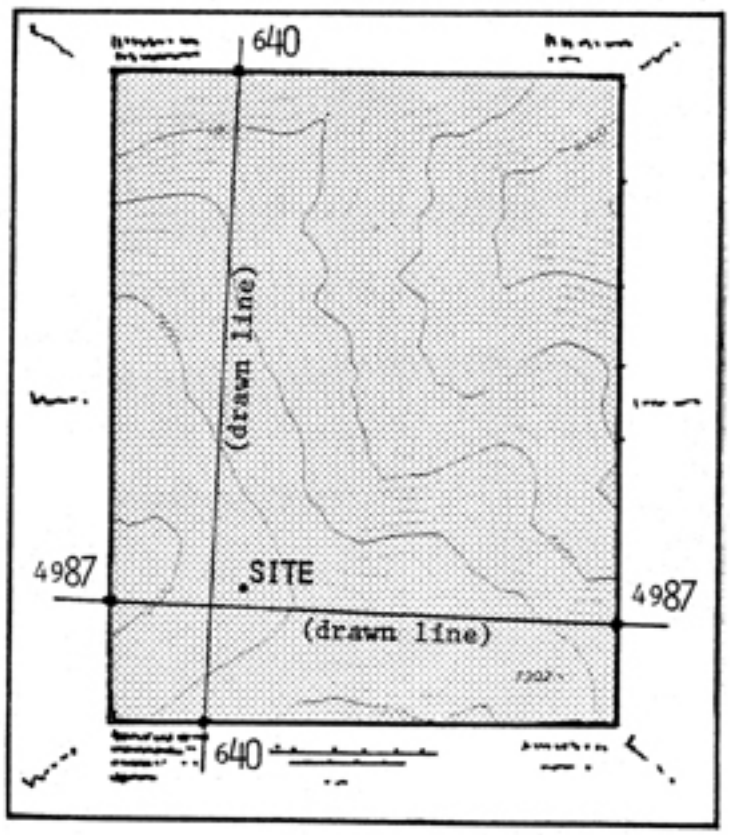


Figure 4. USGS map with lines drawn to connect UTM ticks. The lines intersect southwest of the point.

5. Record the easting and northing values of the drawn lines. In our example (Fig. 4), this would be 640___ m. E. and 4987___ m. N. (If this is unclear, see the Notes below.) These are the first digits of your complete UTM location; the last three digits will be measured with the plastic UTM calculator.

6. Find the scale on the UTM calculator which matches the scale on the bottom of your map. The two most common scales are 1:24,000 (7.5 minutes) and 1:62,500 (15 minute).

7. Using the UTM calculator, measure how far east the point is from the north-south line you drew. Record this as the last three digits of the easting value. The point in Figure 5 is 560 meters east of the line. Thus, the complete easting value is 64056 m E.

8. Repeat the process, measuring from the point to the east-west line to obtain the complete northing value.

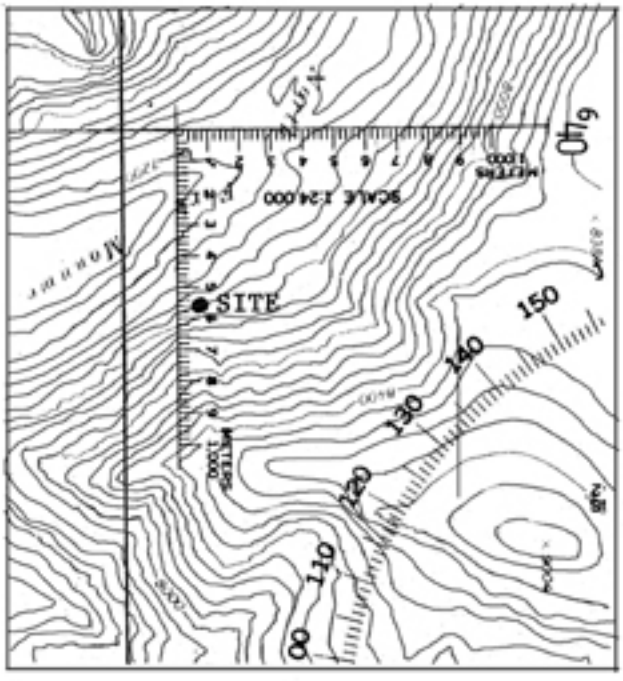


Figure 5. The UTM calculator shows that this point is 560 meters east of the line, or UTM 640560m E.

Other Methods for Calculating UTM

When a point is located near the left hand edge of the map, reverse the process. Subtract the values obtained with the UTM calculator from the closest intersecting ticks to the northeast of the point.

Although the basic method will work, other approaches are faster. Refer to the USDI publication "Using the UTM Grid System to Record Historic Sites", HCRS Publication No. 40, by Wilford Cole (1980).

Notes

1. The light blue UTM ticks on the edge of maps may show only their first three or four digits. Easting values are abbreviated as three digit numbers along the top and bottom edges of the map, and the first digit is shorter than the other two. Northing values are abbreviated as four digit numbers along the left and right hand edges of the map, and the first two digits are shorter. These abbreviations are clarified near the northwest and southeast corners of the map, where a tick will be written out in full (Fig. 2). For example, an easting shown as 523 would be printed in full as 523000m E., or 23,000 meters east of the zone's central meridian. (An arbitrary value of 50,000 meters is assigned to the meridian, as a convenience to avoid negative values.)

2 If the value of a UTM tick is not printed on the map, you can easily calculate it by counting from nearby ticks. Just remember that ticks are spaced every 1,000 meters on 7.5 and 15 minute maps, and that you add when counting north or east and subtract when counting south or west.

3. Northing is the number of meters north of the Equator, and has 7 digits. Easting is the distance from an imaginary point 50,000 meters west of the central meridian. Northing values are larger than easting (6 digits) because it is farther to the Equator.

4. Lines connecting UTM grid ticks of equal value are seldom parallel with the edges of the map. Therefore, when drawing lines across your map, be careful to locate the appropriate pair of UTM ticks regardless of how the lines may look.

5. The divisions numbered 1-9 on the 1:24,000 scale of the UTM calculator represent thousands of meters, and the smallest are 20 meters. Thus, the smallest measurable value at this scale is 10 meters, or a point falling between two of the smallest lines.

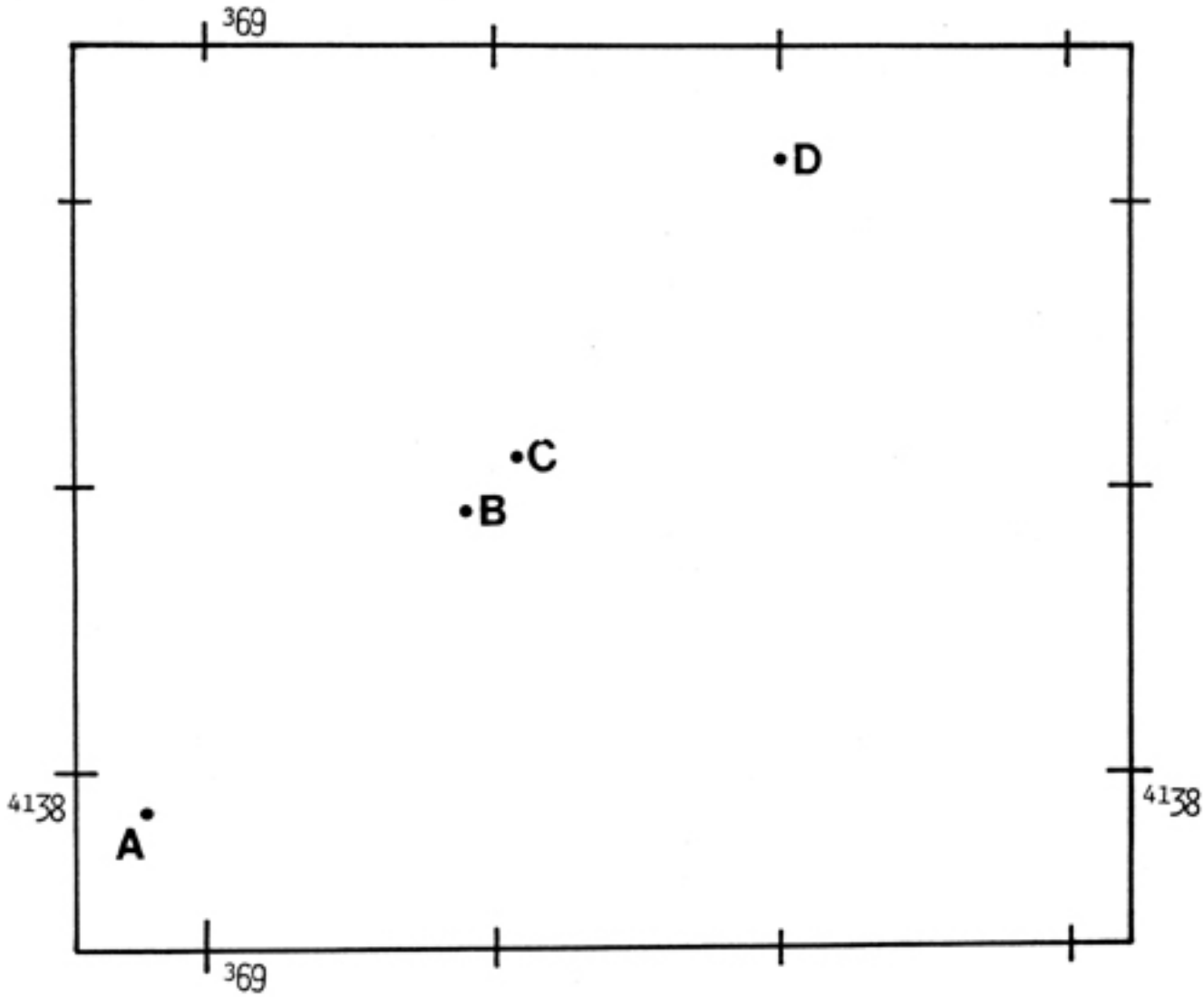
= 450m

6. The divisions numbered 1-4 on the 1:62,5000 scale of the UTM calculator represent thousands of meters, and the smallest are measurements may only be made to the nearest 50 meters. Thus, the measurements may only be made to the nearest 25 meters at this scale. (We are not sure why this scale goes beyond 1,000 meters, because you should never need anything more.)

= 625m

UTM EXERCISE #1

Using the scale for a 7,5 minute map, calculate the UTM Easting and Northing for sites A, B, C, and D. Assume Zone 11. Record your answers in the spaces provided below. The correct UTM values are shown upside-down. (Variation of 10 meters is acceptable.)



Your answers:

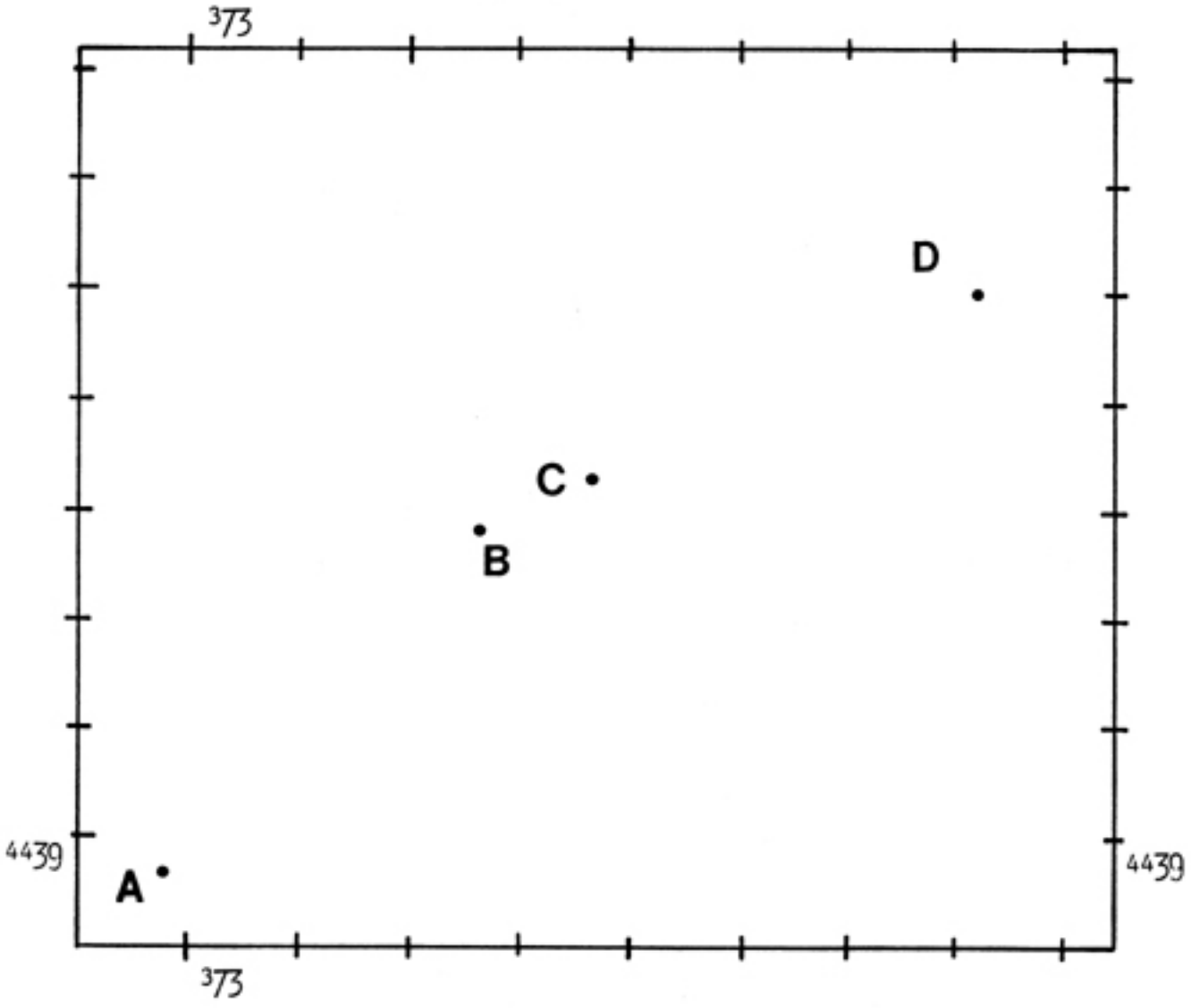
	Zone	Easting	Northing
A			
B			
C			
D			

Correct answers:

	Zone	Easting	Northing
A	11	368790	4138760
B	11	369000	4138620
C	11	370080	4138640
D	11	371000	4138650

UTM EXERCISE #2

Using the scale for a 15 minute map, calculate the UTM Easting and Northing for sites A, B, C, and D. Assume Zone 11. Record your answers in the spaces provided below. The correct UTM values are shown upside-down. (Variation of 25 meters is acceptable.)



Your answers:

	Zone	Easting	Northing
A			
B			
C			
D			

Correct answers:

	Zone	Easting	Northing
A	11	372805	4437850
B	11	375625	4441850
C	11	376550	4442300
D	11	380225	4440000

510 - Rock Art

If pictographs or petroglyphs are present at the site, check PE or PI in Part B - Prehistoric Sites, #13 and use the Rock Art Site Form.

NUMBER THE PANELS CONSECUTIVELY AND COMPLETE ONE FORM FOR EACH PANEL.

1. Number Of Panels At This Site: Indicate the total number of rock art panels present at the site. (A panel of rock art is defined as a group of figures that together form a discrete unit because of their proximity. A single isolated figure is also defined as one panel.)

2. This Form Is For Panel Number: Indicate which panel the form documents.

3. Panel Is Situated On: Indicate the type of landform on which the panel is located. (Portable rock art is defined as handheld stones or small, flat slabs of rock that are incised, scratched, pecked, painted, etc. Where several decorated stones are found together at one site and are on the same type or rock, same background, etc., include them all on one rock art site form.)

4. Worked Surface Is: Indicate slope of worked surface. For this purpose, a panel is considered vertical or horizontal if it is within the limits of 10° plus or minus from true vertical or horizontal.

5. Type Of Rock: Indicate the type of rock on which the panel is found, also give formation name if known.

6. Background: Indicate the type of background for the panel. Under Additional Information, describe color, texture, depth, etc.

7. Category and Technique:

   Petroglyphs: These are formed by removing a portion of the rock surface by different methods. Lines that form the figures or the figures themselves are:

   Abraded: Figures are formed by rubbing or wearing away the rock surface. Generally a smooth stone was used to produce a smooth uniform figure or line.

   Cupule: These are small round depressions that are similar to small mortars. They are found in rock art panels on cliff faces, on boulders, on bedrock, etc. They may be either smooth or rough.

Incised: Figures are formed by grooves cut into the rock. The figures appear to be made with a sharp tool going repeatedly over the same line.

Scratched: Figures are formed from single sharp distinct lines. These often have the appearance of having been made with the point of a knife. Quite often they are very faint.

Solid Pecked: Figures themselves are formed by removing a solid area of the rock by repeatedly striking it with a hammerstone or other tool knocking away small amounts of stone and leaving identifiable dint marks. The individual figures may be outlined with a solid line or totally filled in.

Stipple Pecked: Figures are formed from dots or short lines.

Other: This category includes rare or unusual petroglyph techniques like drilling, inlay, or relief.

Pictographs: These are painted figures. They may consist of a single color - monochrome, or multiple colors - polychrome. Indicate under Additional Information any observations relative to colors, or techniques used to apply paint. (Examples of techniques are: sprayed, brushed, finger daubed.)

Combinations: Where combinations of pictographs and petroglyphs exist, indicate on the form and provide a field sketch showing details.

8. Petroglyph Repatination: Indicate the degree of repatination. Petroglyph repatination refers to the amount of Desert Varnish that has reformed on petroglyphs. Desert Varnish patina is a manganese oxide/clay mineral coating that accretes on rock surfaces deepening and darkening with age. When a petroglyph is formed, the Desert Varnish is removed exposing the lighter colored underlying rock which then begins to repatinate, eventually reaching a plateau where the final color is dependant on a number of factors. These include exposure, availability of manganese, water, etc. The blue-black glossy Desert Varnish is thought to be the oldest. The color difference between the petroglyph and surrounding rock is an indicator of the relative age of the petroglyph.

9. Number Of Figures: Indicate the total number of figures in the panel. A figure is defined as any design, pattern, symbol, diagram, representation, image, etc.

10. Rock Art Figures Superimposed: Superimposition refers to the placing of one figure partly or totally over another indicating relative age. Describe any superimposed figures and indicate their presence on the panel sketch.

11. Incorporation of Natural Features in Design or Figures: Natural rock features such as cracks, holes, edges, knobs, etc., are occasionally embodied in the makeup of the Rock Art figures. Describe any that are present and indicate on the Panel sketch.

12. Surface Preparation Prior to Rock Art Application: Rock art is occasionally placed on a rock surface that has received prior preparation. For example, the rock surface may have been ground smooth before being painted. Describe and indicate on the panel sketch any areas that appear to have been prepared.

13. Prehistoric Figure Modification: Indicate the presence of any modification of the Rock Art figures that may have been done prehistorically. Describe them and indicate on the site sketch.

14. Panel Orientation/Aspect: Indicate the direction in degrees that the panel faces. For a panel that faces in more than one direction, check multi-directional and indicate the general direction.

15. Panel Dimensions: Fill in panel dimensions in meters.

16. Height of Lowest Rock Art Figure Above Present Ground Level: Indicate the height of the base of the lowest rock art figure above present ground level. Where rock art figures are at and appear to extend below ground level, indicate with a zero. Describe and indicate on the panel sketch. If the panel is above a rock ledge where there is no soil or fill write in "not applicable".

17. Height of Highest Rock Art Element Above Present Ground Level: Indicate the height of the top of the highest rock art figure above present ground level. If the panel is above a rock ledge where there is no soil or fill write in "not applicable".

18. Natural Destructive Agents. Indicate if the panel has been impacted by natural agents. Use percentages (round off to nearest 10th) to indicate how much of the panel has been affected.

19. Cultural Impacting Agents: Indicate if the panel that has been impacted by vandalism. Use percentages (round off to the nearest 10th) to indicate how much of the panel has been affected.

20. Provide a Field Sketch of the Panel: Key in manufacturing techniques, impacting agents, superimposed figures, colors (using a Munsell color chart if possible), etc.

IMACS encoding of Rock Art data is not anticipated for the near future. Code letters are only for uniformity of personal use.

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IMACS SITE FORM
Part A - Administrative Data

INTERMOUNTAIN ANTIQUITIES COMPUTER SYSTEM
Form approved for use by
BLM - Utah, Idaho, Wyoming, Nevada
Division of State History - Utah, Wyoming
USFS - Intermountain Region
NPS - Utah, Wyoming

*1. State No. _____
*2. Agency No. _____
3. Temp. No. _____

4. State _____ County _____
5. Project _____
*6. Report No. _____
7. Site Name / Property Name _____
8. Class ☐ Prehistoric ☐ Historic ☐ Paleontologic ☐ Ethnographic
9. Site Type _____
*10. Elevation _____ ft.
*11. UTM Grid Zone ____ _____ m E _____ m N
*12. _____ of _____ of _____ of Section _____ T. _____ R. _____
*13. Meridian _____
*14. Map Reference _____
15. Aerial Photo _____
16. Location and Access _____

*17. Land Owner _____
*18. Federal Administrative Units _____ _____
*19. Location of Curated Materials _____
20. Site Description _____

*21. Site Condition ☐ Excellent (A) ☐ Good (B) ☐ Fair (C) ☐ Poor (D)
*22. Impact Agent(s) _____

*23. National Register Status ☐ Significant (C) ☐ Non-Significant (D) ☐ Unevaluated (Z)
Justify _____

24. Photos _____
25. Recorded by _____
*26. Survey Organization _____ *28. Survey Date _____
27. Assisting Crew Members _____

List of Attachments:
☐ Part B ☐ Topo Map ☐ Photos ☐ Continuation Sheets
☐ Part C ☐ Site Sketch ☐ Artifact/Feature Sketch ☐ Other: _____
☐ Part E

BLM 8100-1
FS R-4 2300-2
3/90

*Encoded data items

1990

IMACS ENCODING FORM

To be completed for each site form.
For instructions and codes, see IMACS Users Guide.

Encoder's Name _____

A

1 State Site Number

2 Agency Site Number

6 Agency Report Number

10 Elevation

11 Zone / Easting / Northing

12 1/4 / 1/4 / 1/4 / Sec. / T. / R.

13 Merid.

14 USGS Map

17 Owner

18 Forest / Dist./Park

19 Loc. Curated Materials

21 Cond.

22 Impacts

23 N.R.

26 Organ.

28 Survey Date

29 Slope / Aspect

30 Water: distance/type

31 Geog. Unit

32 Topographic Location: 1st / 2nd

33 Dep.

34 Vegetation: 1 2 3

35 Misc. Text, Site Name

B

2 Culture/Dating Method

3 Area

4 Collect

5 Depth

6 Excav. Status

7 Prehistoric Artifacts

8 Lithic Tools: # / type

9 # / Flaking Stages

11 Ceramics: # / type

13 Features: # / type

14 Architecture: # / material / type

C

2 Historic Themes

3 Cultures / Dating Method

4 Dates

5 Area

6 Collect.

7 Depth

8 Excav. Status

9 Artifacts

14 Features: # / type

15 Architecture: # / material / type

Part A - Environmental Data

*29. Slope _____ (Degrees) _____ Aspect (Degrees)

*30. Distance to Permanent Water _____ x 100 Meters

*Type of Water Source ☐ Spring/Seep (A) ☐ Stream/River (B) ☐ Lake (C) ☐ Other (D)

Name of Water Source _____

*31. Geographic Unit _____

*32. Topographic Location - *See Guide for additional information*

PRIMARY LANDFORM

- ☐ Mountain spine (A)
- ☐ Hill (B)
- ☐ Tableland/Mesa (C)
- ☐ Ridge (D)
- ☐ Valley (E)
- ☐ Plain (F)
- ☐ Canyon (G)
- ☐ Island (H)
- ☐ Alluvial fan (A)
- ☐ Alcove/Rock Shelter (B)
- ☐ Arroyo (C)
- ☐ Basin (D)
- ☐ Cave (E)
- ☐ Cliff (F)
- ☐ Delta (G)
- ☐ Detached Monolith (H)

SECONDARY LANDFORM

- ☐ Dune (I)
- ☐ Floodplain (J)
- ☐ Ledge (K)
- ☐ Mesa/Butte (L)
- ☐ Playa (M)
- ☐ Port. Geo. Feature (N)
- ☐ Plain (O)
- ☐ Ridge/Knoll (P)
- ☐ Slope (Q)
- ☐ Terrace/Bench (R)
- ☐ Talus Slope (S)
- ☐ Island (T)
- ☐ Outcrop (U)
- ☐ Spring Mound/Bog (V)
- ☐ Valley (W)
- ☐ Cutbank (X)
- ☐ Riser (Y)
- ☐ Multiple S. Landforms (1)
- ☐ Bar (2)
- ☐ Lagoon (3)
- ☐ Ephemeral Wash (4)
- ☐ Kipuka (5)
- ☐ Saddle/Pass (6)
- ☐ Graben (7)

Describe _____

*33. On-site Depositional Context

- ☐ Fan (A)
- ☐ Talus (B)
- ☐ Dune (C)
- ☐ Stream Terrace (D)
- ☐ Playa (E)
- ☐ Outcrop (Q)
- ☐ Extinct Lake (F)
- ☐ Extant Lake (G)
- ☐ Alluvial Plain (H)
- ☐ Colluvium (I)
- ☐ Morraine (J)
- ☐ Flood Plain (K)
- ☐ Marsh (L)
- ☐ Landslide/Slump (M)
- ☐ Delta (N)
- ☐ Desert Pavement (P)
- ☐ Stream Bed (R)
- ☐ Aeolian (S)
- ☐ None (T)
- ☐ Residual (U)

Description of Soil _____

34. Vegetation

*a. Life Zone

☐ Arctic-Alpine (A) ☐ Hudsonian (B) ☐ Canadian (C) ☐ Transitional (D) ☐ Upper Sonoran (E) ☐ Lower Sonoran (F)

*b. Community

Primary On-Site _____	Secondary On-Site _____	Surrounding Site _____
Aspen (A)	Other/Mixed Conifer (G)	Grassland/Steppe (M)	Marsh/Swamp (S)
Spruce-Fir (B)	Pinyon-Juniper Woodland (H)	Desert Lake Shore (N)	Lake/Reservoir (T)
Douglas Fir (C)	Wet Meadow (I)	Shadscale Community (O)	Agricultural (U)
Alpine Tundra (D)	Dry Meadow (J)	Tall Sagebrush (P)	Blackbrush (V)
Ponderosa Pine (E)	Oak-Maple Shrub (K)	Low Sagebrush (Q)	Creosote Bush (Y)
Lodgepole Pine (F)	Riparian (L)	Barren (R)	

Describe _____

*35. Miscellaneous Text _____

36. Comments/Continuations _____

Part C - Historic Sites

Site No.(s) _____

1. Site Type _____

*2. Historic Theme(s) _____

	CULTURAL AFFILIATION	DATING METHOD	CULTURAL AFFILIATION	DATING METHOD
*3. Culture				

Describe _____

*4. Oldest Date _____ Recent Date _____

How Determined? _____

5. Site Dimensions _____ m X _____ m *Area _____ sq m

*6. Surface Collection/Method
- ☐ None (A)
- ☐ Grab Sample (B)
- ☐ Designed Sample (C)
- ☐ Complete Collection (D)

Sampling Method _____

*7. Estimated Depth of Cultural Fill
- ☐ Surface (A)
- ☐ 0 - 20 cm (B)
- ☐ 20 - 100 cm (C)
- ☐ 100 cm + (D)
- ☐ Fill noted but unknown (E)
- ☐ Depth suspected, but not tested (F)

How Estimated _____
(if tested, show location on site map)

*8. Excavation Status ☐ Excavated (A) ☐ Tested (B) ☐ Unexcavated (C)

Testing Method _____

*9. Summary of Artifacts and Debris (Refer to Guide for additional categories)
- ☐ Glass (GL)
- ☐ Metal (ME)
- ☐ Nails (NC, NW)
- ☐ Bone (BO)
- ☐ Ceramics (CS)
- ☐ Fabric (FA)
- ☐ Leather (LE)
- ☐ Wire (WI)
- ☐ Tin Cans
- ☐ Ammunition (AM)
- ☐ Wood (WD)
- ☐ Rubber (RB)
- ☐ Domestic Items (DI)
- ☐ Kitchen Utensils (KU)
- ☐ Car / Car Parts (CR)

Describe _____

10. Ceramic Artifacts

PASTE	GLAZE/ SLIP	DECO-RATION	PATTERN	VESSEL FORM(S)			#

a. Estimated Number of Ceramic Trademarks _____

Describe _____

Part C - Historic Sites

Site No.(s) _____

11. Glass

#	MANUFACTURE	COLOR	FUNCTION	TRADEMARKS	DECORATION

Describe _____

12. Maximum Density - #/sq m (glass and ceramics)

13. Tin Cans

Type	Opening	Size	Modified	Label/Mark	Function

Describe _____

*14. Landscape and Constructed Features (locate on site map) - *See Guide for additional categories*

☐ Trail/Road (TR) ☐ Dump (DU) ☐ Dam, Earthen (DA) ☐ Hearth/Campfire (HE)
☐ Tailings (MT, ML) ☐ Depression (DE) ☐ Ditch (DI) ☐ Quarry (QU)
☐ Rock Alignment (RA) ☐ Cemetary/Burial (CB) ☐ Inscriptions (IN) ☐ Other (OT) _____

Describe _____

*15. Buildings and Structures (locate on site map)

#	MATERIAL	TYPE	#	MATERIAL	TYPE

Describe _____

16. Comments/Continuations - *Please make note of any Historic Record searches performed (for example - County Records, General Land Office, Historical Society, Land Management Agency Records, Oral Histories/Interviews)*

Part B - Prehistoric Sites

Site No.(s) _____

1. Site Type _____

	CULTURAL AFFILIATION	DATING METHOD	CULTURAL AFFILIATION	DATING METHOD
2. Culture	_____	_____	_____	_____

Describe _____

3. Site Dimensions _____ m X _____ m *Area _____ sq. m

4. Surface Collection/Method
☐ None (A) ☐ Designed Sample (C)
☐ Grab Sample (B) ☐ Complete Collection (D)

Sampling Method _____

5. Estimated Depth of Cultural Fill
☐ Surface (A) ☐ 20 - 100 cm (C) ☐ Fill noted but unknown (E)
☐ 0 - 20 cm (B) ☐ 100 cm + (D) ☐ Depth Suspected, but not tested (F)

How Estimated _____
(If tested, show location on site map)

6. Excavation Status ☐ Excavated (A) ☐ Tested (B) ☐ Unexcavated (C)
Testing Method _____

7. Summary of Artifacts and Debris *(Refer to Guide for additional categories)*
☐ Lithic Scatter (LS) ☐ Isolated Artifact (IA) ☐ Burned Stone (BS) ☐ Bone Scatter (WB)
☐ Ceramic Scatter (CS) ☐ Organic Remains (VR) ☐ Ground Stone (GS) ☐ Charcoal Scatter (CA)
☐ Basketry/Textiles (BT) ☐ Shell (SL) ☐ Lithic Source(s): _____
Describe _____

*8. Lithic Tools

#	TYPE	#	TYPE
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Describe _____

*9. Lithic Debitage - Estimated Quantity
☐ None (A) ☐ 10 - 25 (C) ☐ 100 - 500 (E)
☐ 1 - 9 (B) ☐ 25 - 100 (D) ☐ 500 + (F)

Material Type _____

Flaking Stages (0) Not Present (1) Rare (2) Common (3) Dominant
Decortication _____ Secondary _____ Tertiary _____ Shatter _____ Core _____

10. Maximum Density - # / sq m (all lithics) _____

Part B - Prehistoric Sites

Site No.(s) _____

*11. Ceramic Artifacts

#	TYPE	#	TYPE

Describe _____

12. Maximum Density - # / sq m (ceramics) _____

*13. Non-Architectural Features (locate on site map) *- See Guide for additional categories*

- ☐ Hearth/Firepit (HE)
- ☐ Midden (MD)
- ☐ Depression (DE)
- ☐ Rubble Mound (RM)
- ☐ Stone Circle (SC)
- ☐ Rock Alignment (RA)
- ☐ Earthen Mound (EM)
- ☐ Burial (BU)
- ☐ Talus Pit (TP)
- ☐ Water Control (WC)
- ☐ Petroglyph (PE)
- ☐ Pictograph (PI)

Describe _____

*14. Architectural Features (locate on site map)

#	MATERIAL	TYPE	#	MATERIAL	TYPE

Describe _____

15. Comments / Continuations

IMACS ROCK ART ATTACHMENT

1. Number of panels at this site _____. Site No(s) _____
_____
2. This form is for panel number _____. _____

3. Panel is situated on:
( ) Bedrock (A) ( ) Cliff Face (D) ( ) Structure (G)
( ) Boulder (B) ( ) Portable-Small Stones (E) ( ) Other (X)
( ) Cave Interior (C) ( ) Rockshelter Interior (F)

4. Worked surface is:
( ) Vertical 1 100 (A) ( ) Horizontal 1 100 (C) ( ) Multiple (E)
( ) Sloping (B) ( ) Overhead (D)

Additional information:_____
_____

5. Type of Rock:
( ) Basalt (A) ( ) Limestone (C) ( ) Tuff (E) ( ) Unknown (Z)
( ) Granite (B) ( ) Sandstone (D) ( ) Other (X)

Formation name if known and additional information:_____
_____

6. Background:
( ) Natural (A) ( ) Patinated (C) ( ) Smoke Blackened (E)
( ) Painted (B) ( ) Plastered (D) ( ) Other (X)

Additional information:_____
_____

7. Category and Technique:
( ) Petroglyphs ( ) Abraded (A) ( ) Incised (C) ( ) Solid Pecked (E)
( ) Cuple (B) ( ) Scratched (D) ( ) Stipple Peck (F)

( ) Pictographs ( ) Monochrome (G) ( ) Outlined (I) ( ) Sprayed (K)
( ) Polychrome (H) ( ) Solid (J) ( ) Stipple (L)

( ) Combinations--painted petroglyphs, etc. (M)

Additional information:_____
_____

8. Petroglyph Repatination:
( ) None: 0 to 5% (A) ( ) Medium: 30 to 60% (C) ( ) Total: 95 to 100% (E)
( ) Light: 5 to 30% (B) ( ) Dark: 60 to 95% (D) ( ) Varies across panel (F)

Additional information:_____
_____

9. Number of Figures:
( ) 1 to 10 (A) ( ) 41 to 50 (E) ( ) 81 to 90 (I)
( ) 11 to 20 (B) ( ) 51 to 60 (F) ( ) 91 to 100 (J)
( ) 21 to 30 (C) ( ) 61 to 70 (G) ( ) Greater than 100 (K)
( ) 31 to 40 (D) ( ) 71 to 80 (H)

10. Rock art figures superimposed: Yes_____ No_____

Describe:_____
_____

11. Incorporation of natural features in design or figures: Yes_____ No_____

Describe:_____
_____

12. Surface preparation prior to rock art application: Yes_____ No_____

Describe:_____
_____

13. Prehistoric figure modification:

( ) Covering with pigment or paint (A)
( ) Covering with plaster or mud (B)
( ) Obliteration - part or total (C)
( ) Reworking/Additions (D)
( ) None (N)
( ) Other (X)

Describe:_____
_____

14. Panel orientation/aspect _____^{o}

( ) Multi-directional. Indicate general direction _____^{o}

15. Panel dimensions (meters):L_____x H_____. Area_____

16. Height of highest rock art figure above present soil line (meters):_____

17. Height of lowest rock art figure above present soil line (meters):_____

18. Natural destructive agents, % of rock art panel affected (Use multiples of 10%):

( ) _____% Bird/insect nest (A)
( ) _____% Exposure - wind/rain (B)
( ) _____% Lichen growth (C)
( ) _____% Mineral deposits (D)
( ) _____% Mud deposits (E)
( ) _____% Surface Spall (F)
( ) _____% Vegetation abutment (G)
( ) _____% Water runoff (H)
( ) _____% None (N)
( ) _____% Other (X)

Additional information:_____
_____

19. Other destructive agenst, % of rock art panel affected (Use multiples of 10%):

( ) _____% Alteration/defacing (A)
( ) _____% Bullet holes (B)
( ) _____% Chalking (C)
( ) _____% Construction activities (D)
( ) _____% Graffiti (E)
( ) _____% Latex mold residue (F)
( ) _____% Livestock (G)
( ) _____% Names, initials, dates (H)
( ) _____% Obliteration (I)
( ) _____% Paint (J)
( ) _____% Removal - attempted (K)
( ) _____% Removal - complete (L)
( ) _____% Smoke blackening (M)
( ) _____ None (N)
( ) _____% Other (X)

Additional information:_____
_____

If warranted, provide a field sketch of the panel. Note manufacturing techniques, impacting agents, superimposed figures, colors (using a Munsell color chart if possible), or any other applicable comments.

Attachments: _____
_____